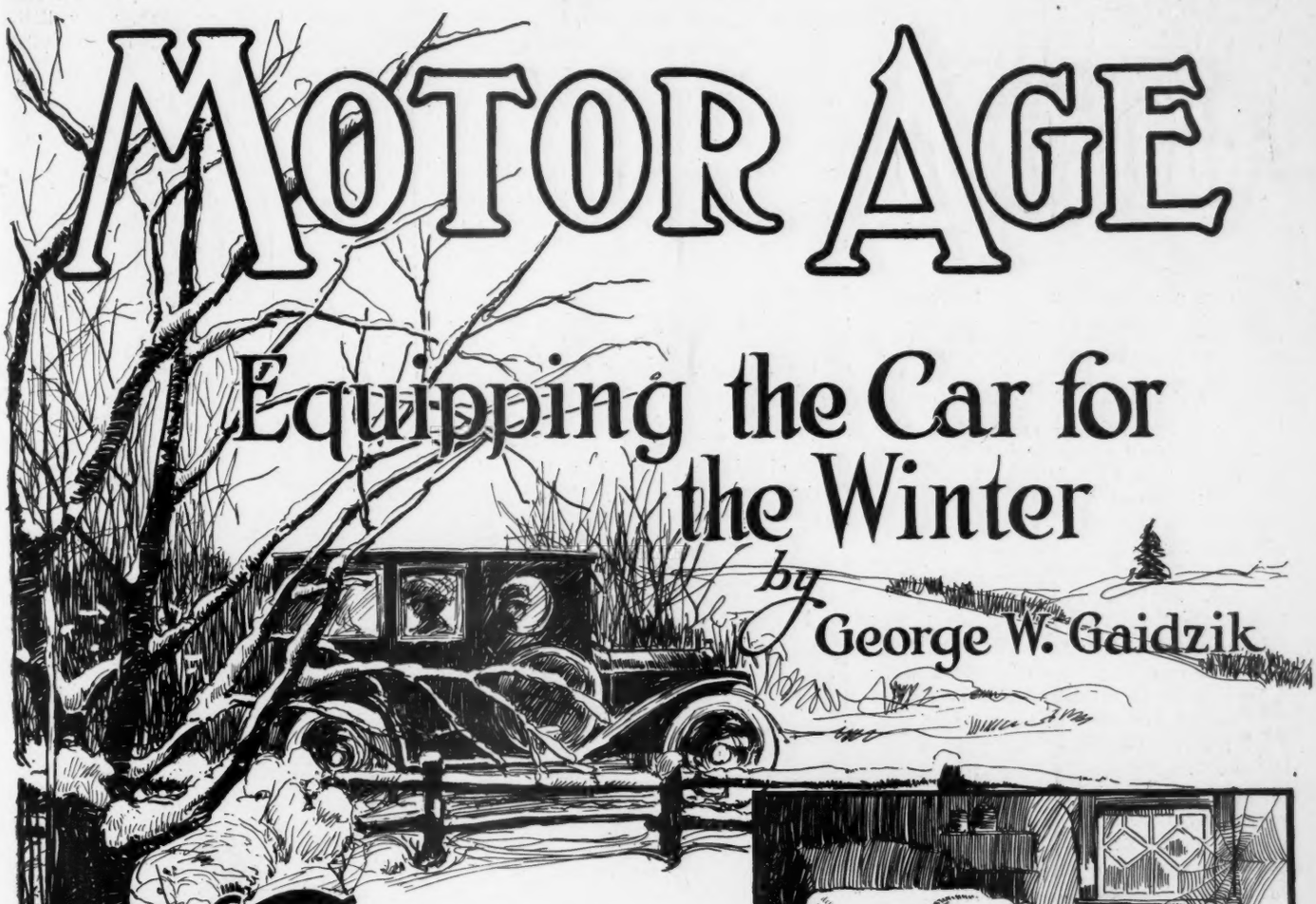
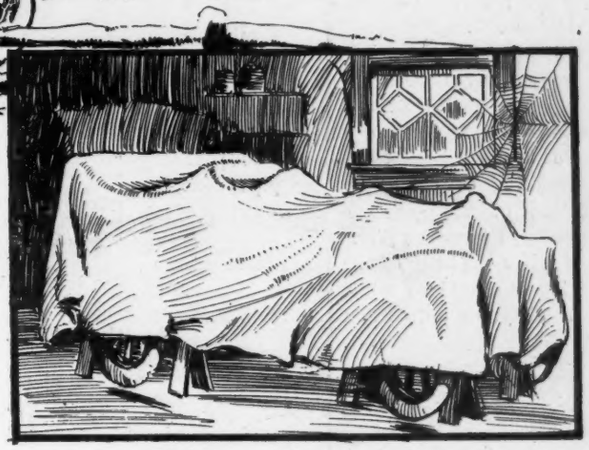
VOL. XX No. 17 CHICAGO, OCTOBER 26, 1911 $3.00 PER YEAR

MOTOR AGE



Equipping the Car for the Winter

by George W. Gaidzik



THE question that now confronts the great majority of motorists is not "how shall I prepare my car for winter storage?" but "what shall I do to prepare it for winter service?" Like sleighing of old, motoring now has become one of the most exhilarating of winter pastimes. Jack Frost has few terrors for those who are prepared to face him. Against merriment and activity all his threats are harmless.

Most of that which follows, therefore, is for the man who has eyes for the season's color, life, movement and force; and an effort is made to explain in detail just how to go about giving the machine the partial overhauling that is considered a wise precaution if the car is to be run throughout the winter months. Certain precautions must be taken to safeguard the cooling system against the effects of freezing and to insure proper lubrication and carburetion under low temperature conditions.

Since, however, there are some localities where the roads are practically impassable during the winter months, and where the motor car, like the woodchuck, is snuggled away for the winter, the subject of laying up the car also is carefully dealt with toward the end of the article.

It is reasonable to believe that a car that has undergone the racking and twisting of a summer's use may show some wear and slight disarrangement of its members. It also is anticipated that a car that is in use all winter will require a pretty thorough overhauling in the spring. The requirements enumerated below, therefore, are based simply on the fact that it is, in the end, cheaper to adopt the protective measures specified than it is to neglect them. The minimum requirements may be summarized as follows:

1—Wash and polish the car.
2—Remove the body and block up the chassis.
3—Drain and clean out the cooling system.
4—Clean and inspect the motor; change the oil in the oiling system.
5—Treat and adjust the clutch.
6—Clean the gearset and thin the lubricant.
7—Clean and relubricate the universal joints.
8—Clean, adjust, and thin the lubricant of the rear axle.
9—Clean and adjust the brakes.
10—Inspect and adjust the wheel bearings.
11—Clean, inspect and adjust the steering mechanism.
12—Inspect the tires, and have cuts or injuries repaired.
13—Clean out the gasoline tank and line.
14—Clean out the acetylene generator and line.
15—Inspect the ignition wiring.
16—See that wheels and axles are in proper alignment.
17—Apply or adjust the heating apparatus for the carbureter or motor car body.
18—Replace the body.
19—Fill the radiator with an anti-freezing solution, or take whatever other necessary precautions against freezing desirable.

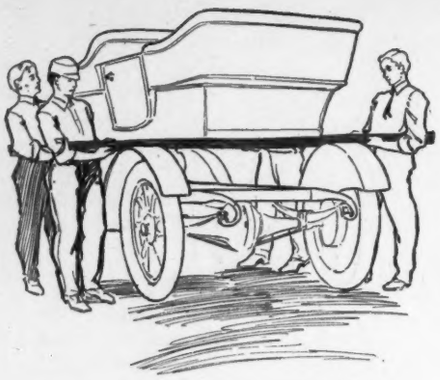


FIG. 1—REMOVING THE BODY

Showing how the body of a motor car can be easily lifted from or onto the chassis, and conveniently transported about the garage or shop

As for the details of the above operations, the washing and polishing of the car is simply to facilitate the inspection and repairs which are to follow. Even in removing the motor car body, some precautions are necessary. Gasoline and air piping and all electric wires must be disconnected from the body, and body bolts loosened. Perhaps the safest method of lifting the body from the chassis is to raise one end at a time, sufficiently high to insert two long bars of wood about 2 by 4 inches in width and thickness and long enough to extend at least 1 foot beyond the outer edges of the fenders on either side of the car. In this way, as illustrated in Fig. 1, four men can conveniently remove a very heavy body from a chassis with little trouble. When the body has been removed it should be set down upon blocks or horses to prevent breaking of the depending pipe connections of the gasoline tank. This also helps to keep out dirt.

After the body of the car is removed the chassis should be rolled out into the yard, or alley, or onto the wash rack, and all parts given a thorough cleaning with gasoline and a brush.

FIG. 2—TESTING REAR WHEEL BEARINGS

Lost motion in a rear wheel bearing is best tested for by taking hold of the tire with one hand to steady the body, then working the wheel up and down with the other hand, assisted by the knee and lower portion of one leg. When the right hand is placed on the hub, the right leg is often more conveniently used than the left as shown in the illustration

Draining and Cleaning Cooling System

After a season's use it often is found that sediment has collected in the radiator, which should be thoroughly cleansed out before the system is filled with the anti-freezing solution. Not only should the radiator be thoroughly cleansed, but the entire cooling system should be drained and flushed out as well. This is best done by disconnecting the hose at the top of the radiator, arranging it so that the water which is to flow from it will be directed into some receptacle or to the ground without running all over the engine, then applying a hose from a hydrant to the top of the radiator, starting the motor and allowing a stream of fresh water to run through the cooling system for one-half hour or so. Inasmuch as there is considerable alkali in some of the water used in different parts of the country, scale or lime incrustations often form in the tubes of the radiator, and in the walls of the waterjackets. These tend to reduce the cooling efficiency of the system and often inhibit the flow of the cooling medium through it.

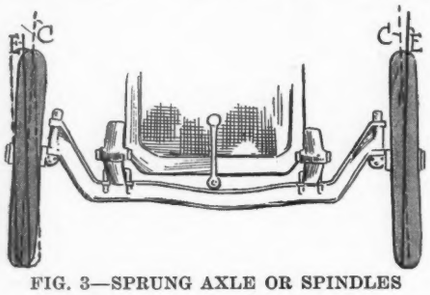


FIG. 3—SPRUNG AXLE OR SPINDLES

A condition often present in a motor car after a hard summer's use. The wheels should line up as indicated by the lines E rather than as indicated by the dotted lines C. If the wheel wobbles while in operation as indicated by the dotted outline of the right wheel, then the wheel itself is out of true

To remove these incrustations, perhaps the safest method is to consult the steam engineers of the locality in which the car is used and learn from them just what boiler-cleaning compound they find most advantageous and use this for cleaning out the cooling system of the motor. The deposits formed in the cooling system of a motor, or in the boilers of an engineer's steam engine plant, vary in composition in different localities and different cleaning compounds are required to cope with the different mineral formations.

One of the best cleaning compounds for general use is a solution of common washing soda, crystals of soda, in water, the proportions being about 2 pounds of washing soda to each gallon of the water contained in the cooling system. This solution is put into the radiator and the motor run for a few minutes to distribute it; then it is left to stand in the motor over night. In the morning the motor is started and run for a few minutes, until it becomes warm, after which the solution is drained out and the cooling system thoroughly flushed out by allowing a stream of fresh, clear water to flow through it.

By carefully cleaning up the motor with gasoline and a brush, many little things often are found which will require tightening, adjusting or repairing. In addition to these the questions of carburation, ignition and lubrication are to be investigated. As cold weather approaches the carbureter must be provided with additional heat for the mixture. Most cars are equipped with means for heating the mixing chamber either with hot water from the cylinder jackets, by means of an air intake in the vicinity of the exhaust manifold, or by exhaust gases conducted direct from the exhaust pipe of the motor through the jacket on the carbureter. It is essential that such provision, whatever it may be, be in working order and that

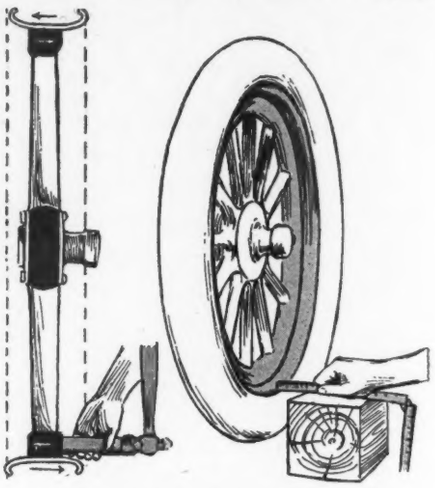


FIG. 4—TRUING UP A WHEEL

If a wheel is suspected of being out of true it may be tested as shown above. With one hand resting on a block to steady it and holding a rule or the like close to the wheel rim, the wheel is revolved very slowly; if it is untrue the space between the end of the rule and the wheel rim will vary. If the trouble is simply due to the rim having shifted on the felloe, it may be rectified as indicated at the left in the illustration

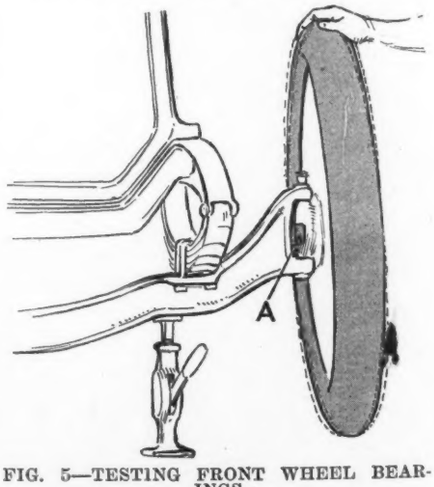


FIG. 5—TESTING FRONT WHEEL BEARINGS

In testing for lost motion in front wheel bearings, a wedge-shaped block or the like should be jammed between the spindle and axle end as shown at A, otherwise lost motion in the spindle or knuckle might be taken for looseness in the wheel bearing. After taking this precaution try to move the wheel as indicated by the dotted lines, and any lost motion in the bearings can be readily felt

the operator be watchful in regulating it to suit the temperature conditions of the alternate warm and cool periods which are likely to succeed one another during the fall. It is important that the throttle and regulating devices are clean and free from dust and gummy oil which might interfere with their action when cold and also that their controlling arrangements are in order and free from lost motion.

Although there is nothing about the ignition system that is liable to be affected seriously by even extremely cold weather, a general going over of the various connections of both the wiring and control rods is advisable. The insulation of the wiring in particular should be looked after and worn spots, or those which have been rotted with oil, carefully wrapped with insulating tape and given a coat of shellac. In a similar way the battery, coil,

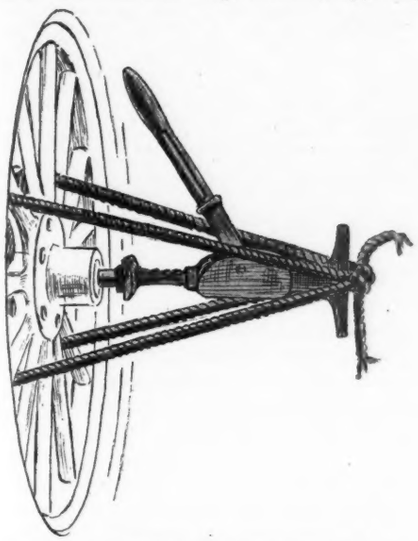


FIG. 6—JACK, THE WHEEL PULLER

This illustration shows how a jack and some rope may be used to remove a wheel that is stuck fast to its shaft when a regular wheel puller is not available. By getting an even strain on each strand of the rope, and then striking the base of the jack a few sharp blows, this method will prove very effective

timer, magneto and contact points should be put in shape, rather with the idea of tuning up for a severe test than giving them what might be termed a thorough overhauling.

The Lubrication System

In the lubrication system one should see that all ducts and feed pipes be thoroughly cleaned, and as soon as the weather becomes cold a lighter grade of cylinder oil may be employed advantageously. In motors having circulating oiling systems with no outside leads whatever, these precautions are hardly necessary, though even in such systems it would be beneficial to drain out all the old oil, put a few quarts of kerosene into the system, run the motor on it for a few minutes, then drain out the kerosene and replace with the required amount of fresh lubricant. On motors having mechanical oilers with adjustable feeds one often can get along very nicely without using a lighter grade

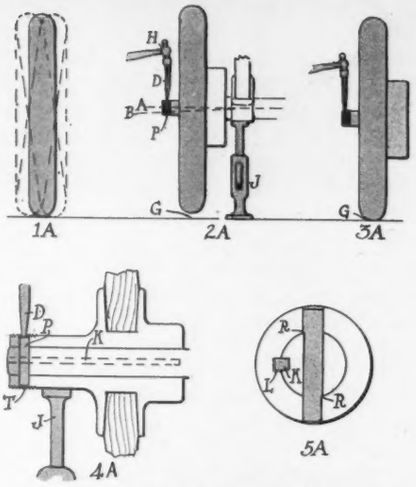


FIG. 7—REAR AXLE PRECAUTIONS

In removing a rear wheel, an unskilled workman can spring the shaft so that the wheel will afterward wobble as indicated above at 1A. This may be done as shown in sketch 2A, with the jack J in the position indicated and the wheel raised from the ground as at G, by using the drift D and hammer H to remove the pin P a few sharp blows are sufficient to bend the axle as indicated by the dotted lines A and B. This can be avoided if the wheel were allowed to rest on the ground G as in sketch 3A; or by placing the jack J under the hub as shown in sketch 4A. When the key K is loose as indicated by the dotted lines L in sketch 5A, grooves R may have been worn into the pin which prevent it from being easily removed

of oil by simply adjusting the feeds so that the required amount will be fed to the engine bearings.

While these operations are being performed on the motor the clutch should be thrown out and secured in that position, and the clutch leather, if it be a cone clutch, soaked with neatsfoot oil. After the oil has been applied the clutch should not be let in for at least a day or two. In the case of a multiple-disk type of clutch, in which the disks run in oil, it would be well to drain out the old oil, flush out the case with kerosene or gasoline, then replace with the required amount of oil generally used in the clutch—this often being a mixture of kerosene and regular cylinder oil. It may be found with regard to the multiple-disk type of clutch that, as the weather grows cooler and tends to thicken up the oil in the clutch, the disks will not release as readily as they should and the clutch will drag and give rise to a grinding noise and difficulty in shifting gears. When this occurs the oil in the clutch housing should be thinned out by adding more kerosene. Before leaving the clutch its operating mechanisms should be thoroughly lubricated and all lost motion eliminated.

The Transmission Gearset

As regards the transmission gearset it generally requires but little attention beyond cleaning it thoroughly, looking after the alignment of the shafts and making sure that the gear-changing lever and its connections are so adjusted as to permit

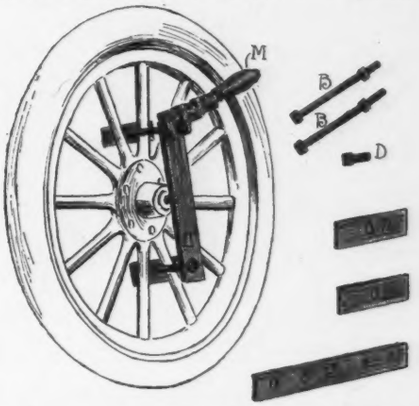
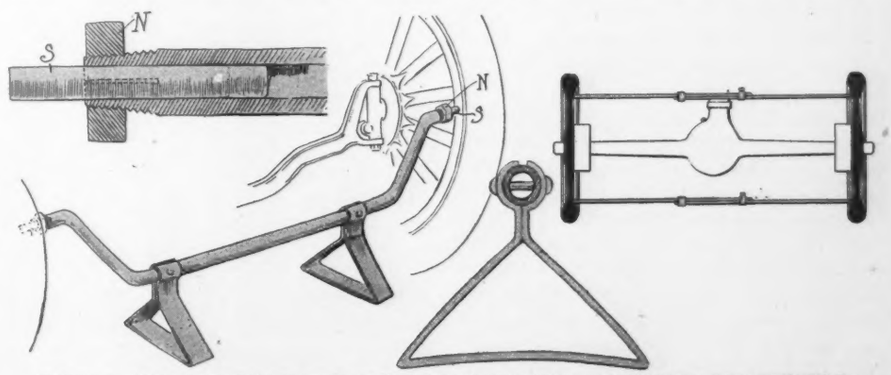


FIG. 10—A MAKESHIFT WHEEL PULLER

This makeshift wheel puller is made from two long bolts B with nuts, a short thick bolt D and three pieces of iron drilled as shown. These parts are applied to the wheel with the short pieces of iron A, behind the spokes of the wheel, and the bolt D communicating between the Bar C and the end of the axle shaft. By taking up evenly on the two nuts with the wrench M and occasionally striking the bar C opposite the bolt D with a hammer, a very stubborn wheel can be easily removed

the gears to mesh properly. If hard grease has been used in the gearset it would be well to remove all of it if convenient, flush out the case with kerosene, and then refill with a thinner mixture of hard grease and cylinder oil. If a heavy grade of fluid transmission oil had been used, this also should be removed and replaced by cylinder oil. While the grease is



FIGS. 8 AND 9—DEVICES FOR TESTING ALIGNMENT OF MOTOR CAR WHEELS

The device at the left is made from a piece of 1-¼-inch gas piping bent into the shape indicated so that it will clear the mud pan of the car when placed behind the front axle. The ends are rendered adjustable as shown above. The ends of the pipe have tapered threads and are slotted longitudinally as revealed by the dotted line. On loosening the nut N the shaft S may be adjusted so that it will touch the felloe of the wheel and locked in that position by tightening the nut N. A simpler device may be made from a pair of yard sticks or the like secured together by means of a sliding joint with a thumb screw in one of the clamps. This device can be used for both the front and rear wheels of most cars

cleaned from the case it is well to inspect the gears, and to take hold of the shafts and try to work them up and down to see if there is much lost motion in the bearings. If annular ball bearings or plain bearings of the non-adjustable type are employed, it would hardly be advisable to try to take up any lost motion except where it is sufficiently marked to cause possible trouble before the spring overhauling. If, on the other hand, the transmission bearings are loose and adjustments are provided, this becomes an opportune

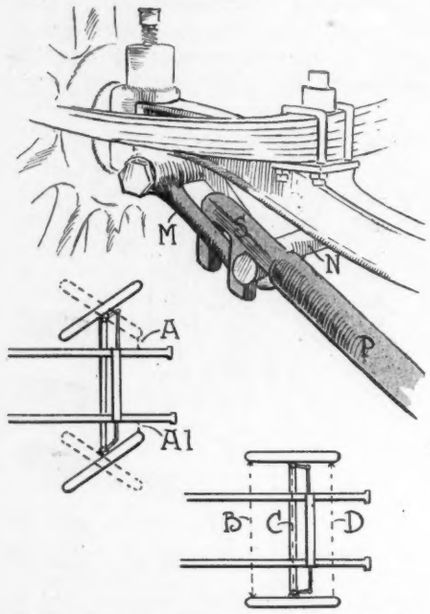


FIG. 11—ADJUSTING FRONT WHEELS

The steering rods of a motor car should be adjusted so that when the steering wheel is turned as far as possible in one direction, the distance A should be equal to the distance A1 when turned to the limit in the opposite direction. Unless the steering knuckle N is adjustable, the steering arm M must be brought back to its original position by means of a bending bar S with a pipe P on the handle of it to increase the leverage if necessary. A very small bend generally can be removed without heating. For proper foregather the distance D should be about 3-8 of an inch less than the distance B

time to make the necessary adjustments.

Passing from the transmission gearset one's attention turns either to the universal joints of the propeller shaft or the driving chains. If the universal joints are encased it is well to open the cases, replace the old oil with thinner oil.

As for driving chains, there are two methods of treating them. Perhaps the most convenient way to clean and lubricate the chains is as follows: With the rear wheels jacked up off the ground, shift the gear lever to neutral, start the motor, then shift the gear lever to reverse speed, which will cause the rear wheels to turn over very slowly. As the wheels revolve and the chains are moving, squirt gasoline on them to cut away the dirt inside and out. If the chains are very dirty, clean them as thoroughly as possible with a brush and gasoline before using the squirt gun. Avoid the use of a rag or waste for this purpose while the wheels are revolving under power from the motor, for, notwithstanding the possible danger of losing a hand or some fingers should a bunch of cloth or waste be carried onto the gear, the chain might be broken and the gearshaft or bearing severely strained.

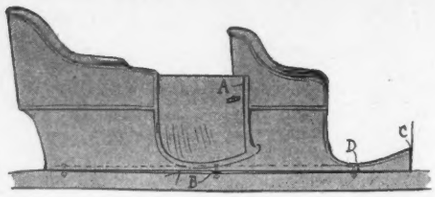


FIG. 12—CAUSES OF BODY SQUEAKS

Washers often are applied between the body and chassis to line it up properly. If all body bolts and washers are removed and replaced indiscriminately, and the washer that belonged at B placed at D, where no washer should be, there might be a squeak between the door and pillar at A and between the front end of the body and the dash at C. Washers sometimes stick to the body when removed then drop off later unnoticed

When the chains are thoroughly cleaned stop the motor, take a handful of medium grade grease and rub it all over the chains, turning the wheels and squeezing the lubricant into the rollers with the hands. This latter is very important, as the friction is inside the chain, there being rolling action between the rivet and roller of the link. Work the grease between the roller and the sidelinks; then wipe off the superfluous grease on the outside of the chain to prevent it as far as possible from accumulating grit and dust, which tends to wear the sprockets.

Another and better method of cleaning the chains is as follows: Remove the chains and clean them thoroughly in hot soda water; that is, water in which washing soda has been dissolved. Or, if this is not handy, remove all grease and grit with gasoline and a brush, being careful to rinse the chain and shake it around in the gasoline so that the grit is removed from between the inside and outside of the links and rollers. After this, wipe the chain dry, and put it in a bath of hot tallow and graphite, the mixture being about one part graphite to seven parts of tallow. This mixture should be heated to about the boiling point of water, so that it will run freely into all parts of the chain, carrying the particles of graphite with it. The chain should be left in this bath for 15 or 20 minutes and then

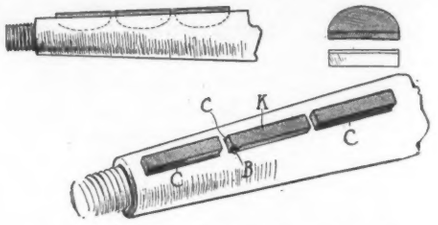


FIG. 14—ERROR IN REPLACING KEYS

Woodruff keys are used on the rear wheel spindles of many motor cars, and sometimes when a wheel is removed one or more of these keys will drop out of place. Should this happen care must be taken to replace them properly. Often the keys are grooved or worn on one side and these grooved or worn sides must all be on the same side. If as indicated above, the grooved side C of the key K is on the opposite side to that of the other two keys, considerable difficulty would be experienced in getting the wheel back on until the key was properly replaced, and the burr B filed off

suspended so that the superfluous tallow will drain off. If the hot tallow and graphite bath is not available, soak the chains in warm oil.

Caring for the Brakes

Knowing the importance of always keeping the brakes of a car in the most perfect working order, the expert driver would no more think of driving his car with the brakes out of adjustment or in poor working order than he would of running the motor without oil. To properly get at the brakes it generally is quite necessary to remove the rear wheels and then thoroughly clean up and lubricate

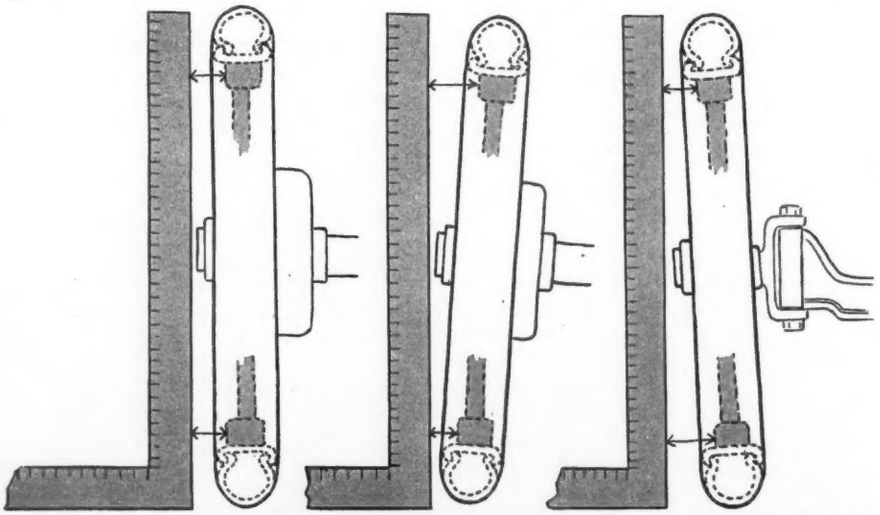


FIG. 13—TESTING ALIGNMENT OF WHEELS BY MEANS OF A LARGE CARPENTER'S SQUARE

The alignment of motor car wheels can be very readily tested by means of a carpenter's scale as shown in the above illustration. The car must rest on a level floor, the tires should stand up full and round, then the square should be placed near the wheel as illustrated. The distances between the vertical portion of the square and the felloe of the wheel at the top and bottom should be measured. The measurement of the opposite wheel should be taken in the same manner and if both are the same the wheels are in alignment. The rear wheels, except where a cambered rear-axle is fitted, should line up with the square as at the left. If the axle is sprung, they would tend to line up as shown in the central figure. Front wheels should converge at the bottom and equally on both sides

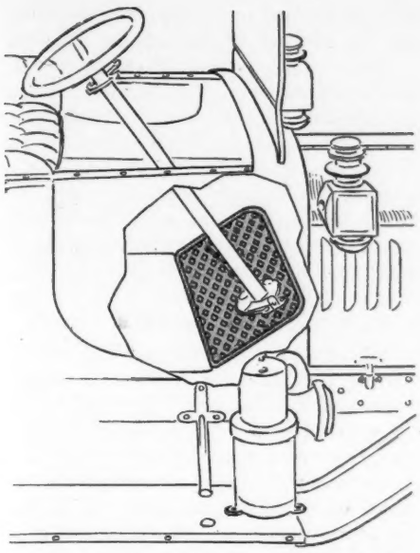


FIG. 15—A PERFORATED FOOTBOARD

The perforated footboard or floorboard, and an apron for closing the end of the mud pan, greatly increases the comfort of motoring in winter, as it permits the heat from the motor, which otherwise would go to waste, to be conducted into the front seat compartment to warm the feet and legs of the occupants

the brake-operating mechanisms enclosed within the hub drum. After all the brake-operating mechanisms have been carefully inspected and lubricated and found to work freely the brakes should be thoroughly adjusted. Before adjusting the brakes it is important that the wheel bearings themselves be properly adjusted, otherwise good adjustment of the brakes will be almost impossible.

After having properly adjusted and inspected the rear wheel bearings the mechanisms of the rear axle should be treated in practically the same manner as the

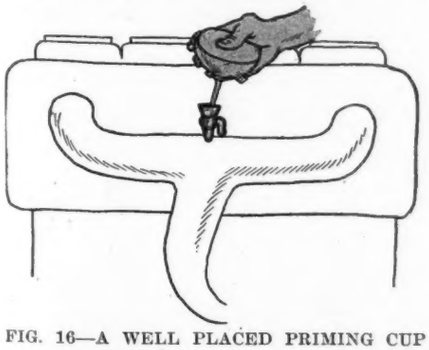


FIG. 16—A WELL PLACED PRIMING CUP

By placing a priming cup in the inlet manifold of the motor as shown in the above illustration, it is claimed by an enthusiastic motorist that much of the troubles of cold weather starting can be eliminated

gearset. The driving pinion of the rear axle often is greatly in need of adjustment because it cannot be readily adjusted without the operator getting under the car. It is important that adjustment be maintained in this bearing, as in all bearings for that matter, for lack of adjustment, in this case, not only is detrimental to the bearing itself, but also causes excessive wear of the teeth on both the pinion and driving gears, and gives rise to a worrying noise from the rear axle when the car is in operation. This adjustment should be made while the wheels are being revolved under the power of the motor at a fairly high speed, and the brakes applied occasionally to put a drag on the wheels. The adjustment is most correct when the gears operate under a load with the least noise.

Give Steering Gear Attention

No feature of the motor car should be given more thorough inspection than the steering mechanism, though it may require but little attention otherwise. In the steering mechanism itself it is quite possible that no adjustments will be necessary, though it is advisable to remove the grease cup and squirt a few gunfuls of cylinder oil into the case. Follow this by forcing grease into the case with the grease cup until the lubricant begins to work out through the bearings. If there is excessive lost motion in the steering wheel one should see whether the lost motion exists between the wheel and the steering arm, or between the steering arm and the road wheels. If between the steering wheel and the steering arm, it undoubtedly is due to wear or lack of adjustment in the steering mechanism bearings and adjustments often are provided to eliminate lost motion at these points. If no adjustments are provided the lost motion may be overlooked at this point until the general overhauling which will be necessary in the spring, when the bearings will have to be fitted with new bushings. Most of the lost motion in a steering mechanism generally exists in the connections between the steering arm and the steering knuckles of the wheels. Make sure, however, that the steering arm itself is perfectly secure upon its shaft. As for the connecting links between the steering arm and steering knuckles it would be advisable to take these off, thoroughly clean up the pins or balls of the joints, fit new pins where excessive wear is found, and remove all lost motion. This is very important, because where lost motion exists, in these parts which are continually subject to the road vibrations, crystallization of the metals may take place, which renders these connections very unreliable. Owing to the catastrophe that might be brought about through negligence on this point, it should be ever borne in mind that lost motion in the steering connections of a motor car is not to be tolerated.

Lining Up the Road Wheels

The alignment of the road wheels also should be looked after at this time. While it is not generally realized, yet it is none the less true that the failure of tires to give good service in many cases is due to the wheels being out of alignment. This may be caused by maladjustment of the steering knuckle connections, sprung steering rod or arms, or a twist in the axle from road shocks—all of which result in throwing the wheels out of parallel with the center line of the car. There is a point in connection with the alignment of the front wheels, termed foregather, which is not generally understood. This is a converging of the wheels toward the front so that in actual operation they will run parallel with each other, there being a tendency of the wheels to flare out toward the front or spring out a trifle when the car is in operation. In order that the front wheels of a vehicle may run and steer properly, the cross link of the steering gear should be adjusted so there will be from ¼ to ½ inch foregather present. This means that the foremost points of the wheel felloes should be from ¼ to ½ inch closer together than the hindmost points of the wheel felloes.

A quick method for testing the front wheels is to measure the distance between

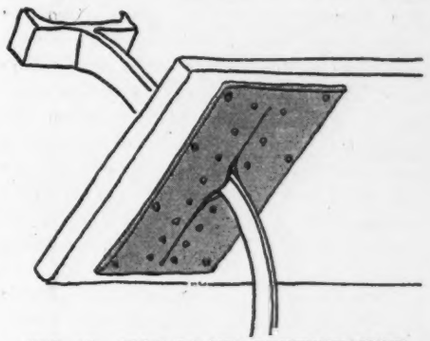


FIG. 17—COLD DRAFT PREVENTATIVE

On cars which have but short mud pans or none at all, leaving the chassis very open under the front seat compartment, the cold drafts that come up through the slots in the footboard may be considerably reduced by nailing a piece of sheet rubber with a slit in it on the under side of the footboard, as shown in the above illustration

the felloes and the front spring in front and behind the axle, then without moving the wheel make similar measurements on the opposite wheel and see how they compare. A very simple instrument can be made for lining up wheels by taking a strip of wood about ½ by 1 inch and 6½ feet long, cut it in halves and make a clamp for each half, so that when put together a sliding adjustable lap joint will be formed in the center. With this tool the distance between the felloes of the

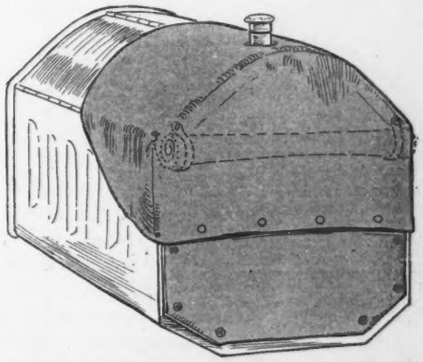


FIG. 18—WINTER BONNET FOR RADIATOR

Motorists who do not care to put anti-freezing solutions in the cooling systems of their cars, might prefer to procure a hood for their radiators such as is shown above. This hood has a removable top portion which is to be used only in very cold weather or when the car is required to stand out in the cold without running. The top portion may be rolled up part way as indicated by the dotted lines when the motor is in operation

wheels in front and behind the axles may be readily taken. Repair shops generally have special tools for this purpose, but for the want of something better a tape measure may serve the purpose very nicely.

For Testing Sprung Axles

For testing for a sprung axle a large carpenter's square may be advantageously used, as shown in Fig. 13; the car being allowed to rest flat on the floor, the square being rested up against the wheel as shown, and the distance between the felloes and the square at the top and bottom of the wheel being measured. Often it will be found on applying the square in this manner to a rear wheel that though the square will be about 1 inch from the felloe of the wheel at the lower point, at the top of the wheel the felloe may be 1½ inches from the edge of the square, showing that the axle is sprung sufficiently to cause this difference. When an axle is sprung in this manner the strains on the wheel bearings are unequal and the appearance of the car is not benefited by the flaring out of the wheels at the bottom. This condition in a rear axle often can be improved by simply tightening the truss rod arranged beneath the rear axle housing. Lack of adjustment of cup-and-cone bearings also has caused the rear wheels to flare out in this manner. The square may be used in the same way in testing for a sprung front axle. Front wheels generally are dished and should converge at the bottom; that is, the felloes of the wheels at the bottom should be closer together than at the top. The amount of this convergence varies in different cars, but can readily be obtained by consulting the manufacturer or having the agents in one's respective territory take these measurements from a new car.

If there are any cuts or bruises in the tires it is well to remove the tires and send them to a repairman while the mechanisms of the car are being cleaned, lubricated and adjusted. While the tires are off, any rust that may have accumulated on the rims and rings should be cleaned off with sandpaper until a bright smooth finish is obtained, then the rims and rings should be painted with any of the special graphite paints on the market, or with a pasty mixture of graphite and glycerine. This will prevent rusting of the rims when the tires are replaced and again in use, and will greatly facilitate removal of the tires when necessary to make a repair at some future time.

The gasoline tank should be drained and flushed out if possible, and the line between the gasoline tank and carbureter thoroughly cleaned out by forcing air and gasoline through it by means of a squirt gun or tire pump. The acetylene geenrator and the piping leading to the head lamps can be treated in a similar manner. Timely precautions of this nature, although seemingly unnecessary, may prevent considerabel annoyance and trouble later on when these features are less accessible.

Regarding Heating Appliances

In the past 2 or 3 years a number of motor car heating appliances have been brought out which add greatly to the comfort of motoring in winter. It is possible for one to find considerable joy and physical benefit from motoring in winter, providing one is not cold; while, on the other hand, if one suffers from the cold the ride becomes more of a hardship. Among the heating appliances brought out, some utilize the heat from the exhaust pipe and conduct it through suitable registers in the floorboard into the tonneau or front seat compartment of the car. Others utilize hot water from the cooling system for the same purpose and in a somewhat similar manner. By simply replacing the footboard of a motor car by a heavy wire screen or grating, as shown in Fig. 15, the front seat compartment of the car can be rendered very comfortable.

A Final Inspection Advisable

Having thus overhauled the chassis it is wise to give the car a thorough general inspection, lubricating all moving parts of the chassis, such as brakerod and spring shackle connections, then replace the body. In replacing the body be careful that all washers that may have been used between the frame and body sill are properly replaced, and all wire connections properly secured. Should a washer have been eliminated for instance in the center of the chassis, it will be found later on that the door of the tonneau would be apt to rub against the front sill portion, giving rise to a squeaky noise when the car is in operation. To connect up the feed pipe to the carbureter, or the gasoline tank, is one of the most simple operations, but should it have been possible that the pipe had been slightly bent during the overhauling difficulty might be experienced in making the connection. If the coupling does not go together readily it often is due to the fact that the pipe does not line up properly and a little bending of it will enable the operator to complete the connection without trouble. One should be careful not to cross the threads in effect-

Truck Contest Figures Are Revised

San Francisco Promoters Find Errors Which Change Results —Brush, Reo, Autocar, Reliance and White Now Declared Class Winners—White Given the Grand Sweepstakes Prize

SAN FRANCISCO, Cal., Oct. 15—Owing the fact that several errors were found in the official records of last week's 2-day motor truck contest in this city, a new and revised statement has just been issued by Walter G. Manuel, the referee. With the tangle straightened out the position of several trucks in the contest is changed.

In the 1,500-pound division the Reo is declared the winner on its economy record of $.0809 per ton mile, with the Buick second at $.0861 and the White $.0869. The Reo suffered 86 points road penalties while the Buick and White were perfect in this regard. In the 1-ton class the Franklin won at a cost of $.0795 per ton mile, with the Grabowsky second at $.0812.

The Autocar is declared winner in the fifth division with a cost per ton mile of $.0507, and the White second at $.0537. A Federal, which suffered 550 points road penalties, is third at $.0847.

The biggest surprise came in the 5,001 to 7,000-pound class, in which the Reliance is declared the winner with a total cost per ton mile of $.0358. The Packard is second at $.0369. The White is third at $.0376 and the Kelly, originally declared the winner, now comes fourth at $.0388 per ton mile. The Gramm is fifth at $.04 and the Pope-Hartford, which suffered 90 points road penalties, is sixth at $.0429.

In the big division for cars between 7,001 and 10,000 pounds the White No. 19 is again declared the winner. Its cost per ton mile was $.0228, a record which also secured for it the grand prize in the contest. The White No. 23 was second at $.0230; the Pierce-Arrow third at $.02336 and the Speedwell fourth at $.0271. The Lewis, a California-made truck, which suffered 50 points road penalties, came in fifth at $.0298 per ton mile. The following table shows the old and revised figures:

Total cost per ton mile, including penalties at 1-10 cent per penalty:

No. Truck and Class—	First report	Revised
*7—Brush, 1K	$.1815	$.1660
26—Indian, 1K	.3336	.2968
*24—Reo, 3K	.0973	.0809
8—Buick, 3K	.0988	.0861
1—White, 3K	.0987	.0869
*6—Franklin, 4K	.1194	.0795
20—Grabowsky, 4K	.1189	.0812
*22—Autocar, 5K	.0557	.0507
4—White, 5K	.0554	.0537
3—Federal, 5K	.0803	.0847
*11—Reliance, 8K	.0405	.0358
28—Packard, 8K	.0427	.0369
9—White, 8K	.0396	.0376
21—Kelly, 8K	.0390	.0388
13—Gramm, 8K	.0435	.0400
18—Pope-Hartford, 8K	.0577	.0429
*19—White, 9K	.0231	.02228
23—White, 9K	.0973	.0230
17—Pierce-Arrow, 9K	.0243	.02336
14—Speedwell, 9K	.0268	.0271
10—Lewis, 9K	.0306	.0298

* Class winner; No. 19 White also winner of grand prize

WITH TRAIL TO SUNSET TOURISTS

Omaha, Neb., Oct. 21—With their trip of 4,200 miles almost half completed the motorists following the trail to sunset tour are today in Omaha, and Monday morning they will turn southward to strike the Santa Fe trail at Kansas City, entering on that famous highway next Wednesday to follow it over 800 miles into the great southwest. From Chicago, which was last Sunday's control, the tourists traveled to Omaha over the first part

ing a gasoline connection, for then a tight joint will be difficult to obtain.

After having taken these precautions all that remains in a water-cooled car is the equipment of the radiator, or cooling system of the motor, with means to prevent freezing. Perhaps the safest method is to fill the cooling system of the motor with an anti-freezing solution, though some people prefer to simply remove the fan belt and perhaps provide a cover for part of the radiator in exceptionally cool weather.

Though there are several anti-freezing solutions in general use, the combination alcohol, glycerine and water solution is the most popular, and the two following solutions are recommended:

For a temperature not lower than 5 degrees below zero:

Alcohol	15 per cent
Glycerine	15 per cent
Water	70 per cent

For a temperature not lower than 15 degrees below zero:

Alcohol	17 per cent
Glycerine	17 per cent
Water	66 per cent

Laying the Car Up for Winter

With regards to the laying up of the car for the winter, the story may be shortly told. First of all, the cooling system of the motor should be drained and every ounce of water removed therefrom. To accomplish this, open the drain cock underneath the radiator and the one under the water pump, if there be one. When all the water appears to have drained out, rock the body a few times to be sure and get out all of the water. The motor then should be started up and run for a minute or so, to evaporate any moisture remaining in the system. Care should be taken, of course, not to overheat the motor.

With regards to the oiling system of the motor, it is well to drain all the oil therefrom, flush out the crankcase with kerosene and refill to the required amount with fresh oil. To flush out the crankcase, or in fact the entire oiling system, it might be well, after having drained the oil, to put a couple of quarts of kerosene into the oil reservoir and run the motor a few minutes so that the kerosene will be flushed through the entire system, then drained out and replaced with regular cylinder oil. The steel parts of the motor should be cleaned with kerosene, then doped with vaseline to prevent them from rusting; and to prevent the interior of the cylinders from being attacked by rust it is advisable to pour about one-half teacupful of cylinder oil into each cylinder, then crank the motor over very slowly so that the oil will be distributed in rather a thick film about the valves and on the cylinder walls.

The clutch should be fixed in a held-out position and soaked with neatsfoot oil. The clutch mechanisms should be thoroughly cleaned with gasoline and a brush, and oiled and smeared with vaseline where rust would be apt to accumulate. The transmission and running gear might be thoroughly cleaned up and greased. The gasoline should be drained from the gasoline tank; and the car should be jacked up and rested upon blocks or horses in a substantial manner. Tires, then, either can be deflated to about 5 or 10 pounds pressure, or removed entirely and wrapped in cloths sprinkled with soapstone or sulphur and placed in a cool, dark, dry place until again brought into use. If the tires are removed it is advisable to paint the rims with a graphite paint after first thoroughly cleaning off the rust with sandpaper, as previously recommended.

The storage battery should not be allowed to stand in a discharged condition. The best method of caring for the storage battery is to have it fully charged, then pour out the electrolyte, fill with distilled water, and place the battery in circuit with an electric lamp, a water rheostat or some other suitable resistance and discharged at 3.5 amperes. The water then can be emptied from the cells and the cells allowed to stand open until dry. When dry, they should be put in a cool and dark place. To put the battery in use again, after being kept inactive over the winter, one has but to fill the cells with electrolyte of the required strength and charge them.

All brass parts might be treated with three or four applications of good brass polish which should be left on all the while the car is in storage. Another method of preventing the brass parts from tarnishing is to wrap them in cloths.

Laying Up Storage Batteries

Many battery concerns make a specialty of storing batteries during the winter months, their method of treating them being to give the batteries an occasional slow discharge and a freshening charge at intervals of about once a month. Motorists having their own charging outfits can do this also. Many batteries will slowly discharge themselves if left to stand, whilst others may require being connected to a small electric lamp or some other means of furnishing a suitable resistance to discharge the battery slowly.

---

of the old Oregon trail, which was the first highway blazed between the great lakes and the northern Pacific coast. From Davenport to Omaha they followed the river-to-river road. The tourists crossed the Mississippi at Davenport Tuesday night. The first day's journey in Iowa covered exactly 100 miles, Marengo being Wednesday night's control, while Des Moines, Guthrie Center and Omaha were the next three night stops, the waters of the Big Muddy coming into sight after 367 miles had been traveled due west from the Illinois boundary. Next Sunday's stop of the tourists will be at Dodge City, Kan.

WATSON CUP RUN POSTPONED

Syracuse, N. Y., Oct. 21—The annual Watson cup run, under the auspices of the Automobile Club of Syracuse, suffered two more postponements this week because of bad weather. Shifted from Wednesday till today, it had again to be put over and is now scheduled for Wednesday, October 25. Silverman & Grody, agents in Syracuse for the Ford cars, have offered an additional silver cup for the woman driver of a Ford car coming nearest the secret time.

English To Entertain S. A. E. Members

Big Plans Are Made to Care for American Engineers When They Visit United Kingdom—First Week To Be Devoted To Taking in Sights of Olympia Show—Will Visit the Factories

LONDON, Oct. 14—Active preparations are being made for the entertainment of members of the Society of Automobile Engineers who are coming over here. The headquarters of the members of the American society will be at the Hotel Windsor, Westminster, which is quite close to the headquarters of the Institution of Automobile Engineers, the Mechanical and Civil Engineers.

The first week of the arrival of the American visitors will be mostly devoted to viewing the exhibits at the Olympia show. Howard Coffin, one of the past presidents of the institution, will read a paper before the Institution of Automobile Engineers on Wednesday, November 8, and further, a visit has been arranged for November 9 to the works of the London General Omnibus Co., Walthamstow. The visit to these works should prove of great interest, owing to the fact that all the omnibuses of the London General Omnibus Co. are being fitted with chain-driven gear boxes and worm rear axles. At the present time twenty omnibuses per week are being turned out of the factory. On Saturday the 11th the visitors are invited to dinner at the Trocadero restaurant as guests of the Institution of Automobile Engineers. Sunday, November 12, the program includes a visit to Brooklands track, and the visitors will be guests of Mr. Perry of the Ford company, who will provide cars for conveying them to the track.

During the week commencing November 13 arrangements have been made for visiting various factories in the Midlands, such as the Daimler, Sunbeam, etc., and doubtless further entertainments will be provided by motor tours into Stratford-on-Avon, Kenilworth, Warwick and other picturesque places.

MOTOR AGE
Published Weekly by
THE CLASS JOURNAL COMPANY
910 South Michigan Avenue CHICAGO
NEW YORK OFFICE
239 West 39th Street
SUBSCRIPTION RATES
United States and Mexico
$3.00 per Year
Other Countries including
Canada $5.00
Entered as Second-Class Matter September 19, 1899, at the Postoffice at Chicago, Illinois, under Act of March 3, 1879

A Manufacturer's Folly

ONE motor car manufacturer builds a car which retails for less than $3,699, and yet if you had to buy a complete set of the spare parts that go to make up his machine it would cost $17,000. This is according to the price of the different parts as listed in his parts booklet. In a word, the price of all the parts entering into the makeup of his car is over five times that of the original car. In a word, this car maker wants to make a great deal of money out of the misfortunes of the owners of his cars. In a word, he has not the best interests of the cars he has sold at heart, rather he aims to make as much money out of replacements as possible. Every car maker has a right to a reasonable profit out of each spare part that he sells. It costs money to maintain branches or supply depots, and there should be a rational profit on such, but there is not any reason in selling a spare part for over five times the cost of the original piece. If this is necessary the system of branches or supply depots throughout the country is a most deplorable one. A house cleaning is necessary.

THAT car maker, who puts the price of spare parts so high, is a foolish maker. One car owner recently reported to Motor Age a case of where the price the car maker asked for a spare part was $17.60; the owned wrote the concern that made these parts for the car builder and purchased one of them for $3.20. In this case, the car maker had multiplied the cost price of the part by five. This is not a very commendable spirit of assistance for maker to exhibit to user. This is not the spirit that makes an owner feel like buying the same make of car when his present one has completed its field of usefulness. It is because of treatment of this nature that many of the wiser car builders are establishing service departments. Others who cannot establish service departments are changing some of their agencies into semi-service departments. If the service department can reduce the price of car upkeep, and it can, then, as previously stated in these editorial columns, it is going to be one of the most potent selling factors for a car builder. Charging five times the original price for a spare part will never advertise a maker's product. Highway robbery of this sort is going to act against the maker every time. It requires time for buyers of cars to find out the service cost; they are gradually gaining in this matter and it will soon be a question with buyers as to what service the buyer will get after the car has been purchased and also what will be the cost of spare parts. A car owner has today a right to demand such. It is preposterous for car makers to multiply the original price of the part by five, such actions are against the good spirit needed in booming the car industry today.

ONE of the best advertisements to a car maker today is the good will and coöperation of his owners. A satisfied owner is a salesman par excellence. Many car sales are made in the dining room of the club, at a luncheon or dinner party. Here is where the satisfied owner acts as the salesman. A satisfied owner is satisfied for two reasons: First, because his car has given satisfactory service and, second, because he has received good treatment by the dealer or branch manager when his car has given any trouble. There are on record hundreds and thousands of cases where an owner has talked against the make of car he drives solely because of the poor treatment and lack of coöperation he has received from the factory after having purchased the car. This is true in case of touring cars and it is doubly true in case of commercial cars. Cases are on record where a commercial car gave reasonably good service, service sufficiently satisfactory to warrant buying another car of the same make, but the owner refused to buy another solely because of factory treatment in buying spare parts and making repairs. The factory was slow in sending the spare parts and often when they arrived they were for another model. This meant loss of time. On top of this the price was too high. Discontent followed and today these car owners would not buy the same make of car for any price, no matter either how successfully the car might perform.

THIS satisfying of the car owner is one of the biggest problems of the car maker today. It is because of this that so many makers are replacing their leading agencies with branch houses. Some makers think that the ultimate solution of the problem will be the branch house. This is not so. The ultimate solution will be the branch house and the good agency. A good agency will solve the problem almost as well as the branch house. But the good agency has been hampered by the treatment it has received from the factory. Factories have demanded large deposits in advance of the opening of the season. Many of these factories have not given the agency the assistance in the matter of advertising that it should. The car builder who has changed his agency every few years is finding himself today in more or less of a quandary. He finds that he has scores and hundreds of dissatisfied owners. One Chicago agency recently reported that it did not believe that it had a single satisfied owner. The management of the agency had changed from time to time. Each manager had made his promises to prospects and had made sales on these promises. The succeeding manager refused to spend his money caring for those who had previously bought cars on such promises. The net result is discontent. Some of these car builders are having trouble in getting new agencies. An agent would take the agency if he simply had to sell the present model of car, but he has to look after the buyers of last year, of the year before, and perhaps the year before that. Two years ago the car may not have been as good as it is today; it has not given satisfaction. It is the maker who should make good on such problems and not the dealer. The maker should pay the dealer a certain amount each year to care for his old customers. It is the maker who made the money out of these dealers and he has a right to pay the price for the replacement and maintenance work. The different car owners have to solve this problem. It is but one of the many problems in the relationship between maker and owner that must be met and satisfactorily solved. Many makers have already solved it by establishing branches; others are at present contemplating the branch situation, but whatever is done the car owner must receive that attention which plain business methods of today, in other lines of business, warrant.

THE protection of the buyer suggests the question of the guarantee. It is unquestionable if there is any other feature of the business today that is being more abused. In a word, a guarantee should not be necessary. The guarantee means that the maker has not the utmost confidence in his own product. It further means that the buyer is not quite settled in his own mind as to the reliability of the car he is buying. When an owner insists on a guarantee it is safe to say uncertainty exists in his own mind.

France Decides To Race Next Season

Automobile Club Officially Announces It Will Run Two Grand Prix Road Events in 1912—Reliability Also Billed

PARIS, Oct. 19.—Special cablegram—The Automobile Club of France has officially announced that in 1912 it will promote two grand prix road races which will be run simultaneously and which will last 2 days, the distance to be 1,200 miles. In all probability the course will be the Dieppe circuit and the events run in July. It has been decided that one of the races will be with neither weight nor engine limitations, while the other will be for cars of not greater than 183 cubic inches capacity and a minimum weight of 1,760 pounds. The winner of each race is to receive a $4,000 cash prize.

This will be the longest road race ever run. While no definite plans have been announced, it is presumed the affair will be split into 600 miles a day. The first grand prix run in France in 1906 was a 2-day event, the distance being 774 miles, the cars running 387 miles a day, the winner being Szisz in a Renault, who averaged 63.35 miles per hour, it requiring 12 hours 14 minutes to cover the distance. Twenty-nine cars started and eleven finished.

It is declared on good authority that several of the firms which have figured in the big races of a few years ago, but which have disappeared from racing since the Automobile Club of France dropped the grand prix in 1908, will come forth in the light-car races. Among these firms are Fiat, Benz and Lorraine-Dietrich. For the past 3 years light-car races only have interested the smaller and younger concerns, such as Delage, Alcyon, Gregoire, Peugeot and Sizaire. The big manufacturers, not having paid much attention to small cars, have not been interested in this class of race. Now, however, that they are all building touring models of less than 4-inch bore, rated in Europe at 15 horsepower, a light-car race is of considerable importance to them.

It is plainly evident that France is awakening to the need of supporting motor contests, for in addition to the rejuvenation of the grand prix it is announced that France proposes to hold a reliability trial during the first half of March, 1912. Trials of this nature were conducted in 1909 with considerable success, but when brought forward in 1910 under more stringent rules manufacturers refused to toe the line. There has been a change of opinion since then, and as a number of manufacturers have asked for a second edition of the 1909 event, preparations are being made. It is probable that the event will consist of a series of fifteen daily runs of 200 miles each, with bonnets nailed down and all essential parts sealed, the cars being given a minimum and a maximum speed and penalized for late arrival or for speeding. To obtain a clean score the cars would have to cover practically 3,000 miles without the tool box being opened and with no other stops than those necessitated for changing tires. It was at first proposed that the motor never should be stopped during any one day's run, but most manufacturers took objection to this.

FRENCH ROAD LAWS UNCHANGED

Paris, Oct. 16—It is evident that American motorists believe that the rule of the road in France was altered on October 1 so that all traffic kept to the left, instead of to the right, but such is not the case.

The mistake doubtless arises from the fact that an expert committee appointed by the minister of public works recently drew up a road code in which it was recommended, among other things, that the rule of the road should be changed from right to left, that the speed limit should be abolished, and that right of way at cross roads always should be granted to traffic on the wider road. It is the most reasonable and best worked out set of road rules ever devised, but unfortunately it has not yet the weight of law.

As soon as the report was submitted, the minister of public works was bombarded with protests from people who were quite satisfied to drive on the right hand side of the road. The Paris chief of police shuddered at the task of having to shift all traffic from the right to the left; trolley car companies objected to the expense, and even drivers of teams, who would receive most benefit, for they would not longer be in danger of being lopped off when walking by the side of their horses, declared they would rather continue in the old way. In view of this the rule of the road remains unchanged; in France we still keep to the right and are likely to do so for a long time yet.

*October 27-November 3—Eight-day reliability run of Chicago Motor Club.
October 28—Reliability run, Newark, N. J.
October 30—Economy run of Motor Club of Harrisburg, Pa.
October 31—Track meet, Shreveport, La.
November 2-3-4—Reliability run of Quaker City Motor Club, Philadelphia.
November 3-4—Track meet, Columbia, S. C., Automobile Club of Columbia.
November 3-11—England's annual Olympia show.
*November 4-6—Phoenix road race, Maricopa Automobile Club.
*November 9—Track meet of Maricopa Automobile Club, Phoenix, Ariz.
November 9-11—Track meet, San Antonio Automobile Club.
November 20-24—First American road congress at Richmond, Va., under auspices of American Association for Highway Improvement.
November 22—Road users day, American Road Congress, Richmond, Va., under direction of Touring Club of America.
November 22—Start of 11-day around-Georgia tour.
*November 27—Vanderbilt road race, Savannah, Ga.
November 30—Grand Prix race, Savannah, Ga.
January 6-13—Twelfth annual show, pleasure car division, Automobile Board of Trade, Madison Square garden, New York.
January 6-20—Madison Square Garden show, New York City, Automobile Board of Trade.
January 10-17—Annual show, Motor and Accessories Manufacturers, Madison Square garden, New York.
January 10-17—Annual show, National Association of Automobile Manufacturers, Grand Central palace, New York.
January 15-20—Twelfth annual show, commercial division, Automobile Board of Trade, Madison Square garden, New York.
January 18-20—Annual meeting Society of Automobile Engineers, New York.
January 27-February 10—Eleventh annual show under the auspices of the National Association of Automobile Manufacturers, Coliseum, Chicago.
February 14-17—Show at Grand Rapids, Mich.
February 17-24—Minneapolis show.
February 19-24—Show at Hartford, Conn.
March 2-9—Pleasure car show, Boston.
March 13-20—Show of Boston Commercial Motor Vehicle Dealers' Association, Mechanics' building, Boston.
January 20-26—Milwaukee show.
January 22-27—Show at Providence, R. I.
January 22-27—Show at Detroit, Mich.
February 12-17—Show at Kansas City, Mo.

* Sanctioned

BULLDOG REACHES THE YUKON

Seattle, Wash., Oct. 21—News comes from Skagway, Alaska, that Charles G. Percival, driving the Abbott-Detroit Bulldog, has won the silver shield offered by the Daily Alaskan of Skagway for the first motor car to drive from Skagway to the Yukon river over the White pass. Percival was compelled to abandon his attempt to get to Dawson because of the softness of the trail, there being 7 miles of road which it would have been necessary to corduroy in order to make the journey. The Bulldog carried four passengers weighing 745 pounds, and with the equipment the car weighed 4,800 pounds. It bumped 67 miles over the ties from Skagway to Caribou over the summit of White pass, then hit the old trail from Caribou to Whitehorse, which had not been followed even by a horse-drawn vehicle for some years and which is badly washed out. Bridges were built and repaired, corduroy roads laid and gulleys and washouts filled, streams forded and other difficulties surmounted so that the run of 117 miles from Skagway to Whitehorse in 2 days is a wonderful feat and the first time it ever has been accomplished by a motor car. On the trip the Bulldog averaged 8.8 miles to the gallon, despite the heavy going. Percival had to cut short his trip in order to catch a steamer which will land him at Seattle in time to get across the Rockies before winter sets in.

Death Casts Shadow on Glidden Tour

Samuel M. Butler, Chairman of Contest Board of A. A. A. Killed When Pacemaking Car Turns Turtle—Referee Walker and Wife Injured—Maxwell Team Only One Surviving With Perfect Score—Details of the Journey Day by Day

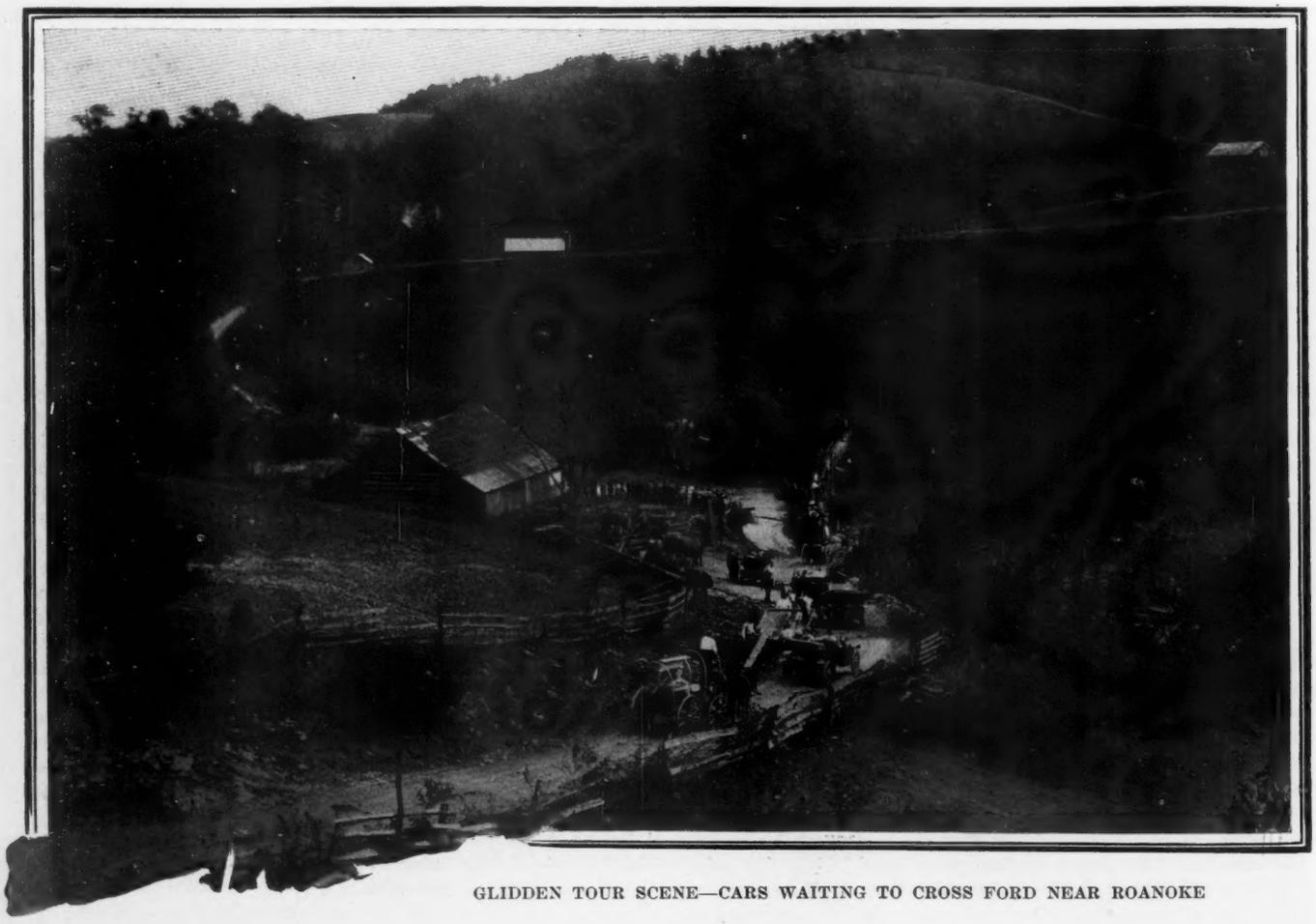
TIFTON, Ga., Oct. 25—Special telegram—Samuel M. Butler, chairman of the contest board of the A. A. A., was instantly killed this morning, and P. J. Walker, referee of the Glidden tour of 1911, and Mrs. Walker were seriously injured when the pacemaking car, in which the official party was riding, broke a steering knuckle and rolled over into a field. When the accident occurred the car was going at about 35 miles an hour over a very good road. The cause of the breakage probably was crystallization of the knuckle during the hard driving earlier in the tour. Mr. Butler was caught under the tonneau when the crash came and was crushed to death. Referee Walker was badly shaken and may have been injured internally, and Mrs. Walker suffered a broken arm.

LIVE OAK, Fla., Oct. 25.—Special telegram — The death of Chairman Butler of the A. A. A. contest board and the injury to Referee Walker left the Glidden tour without a leader this morning, and for a time it looked as if the national event would be brought to a sudden end. Officials of the A. A. A. held a consultation at Tifton, Ga., and debated whether or not to call a halt. As the majority of the contestants were scattered along the route it was determined to go ahead and talk it over later. Under these conditions the tourists proceeded to Live Oak, where they are tonight. R. P. Hooper, president of the A. A. A., who was on the tour, was made referee, and will continue at the head until the finish of the tour at Jacksonville tomorrow night.

The Story of the Tour

The run today was far easier than anticipated. The roads were fine, and, while the morning's fatality cast a gloom on the party, still it was thought advisable to complete the itinerary. It looks tonight as if the Tarrytown, N. Y., team would be the winner of the Glidden trophy. The three Maxwells have gone through so far with perfect scores, and they are the only team without demerits. Closest to them is the No. 2 Atlanta team, made up of three Stevens-Duryea, two of which are perfect, and the third having 19 points. The three Cadillacs representing Jacksonville have done well, and up to last night only had 23 points against them. There are seven other teams left in the battle for the Glidden trophy, the other eight having been eliminated because of withdrawals of one or more of the units, thus disturbing the makeup of the trios.

The latter part of the tour—that is,



GLIDDEN TOUR SCENE—CARS WAITING TO CROSS FORD NEAR ROANOKE

since leaving Atlanta Tuesday morning—has been more in the nature of a pleasure ride, and the tourists are forgetting the hardships they were forced to undergo in Virginia last week, when they encountered unexpected weather conditions.

To Winston-Salem

Winston-Salem, N. C., Oct. 18—Not reported: No. 6 Thomas, No. 8 Flanders, No. 17 Metz, No. 20 Schacht, No. 42 E-M-F, No. 50 Maxwell and No. 53 Flanders. No. 7 White was penalized 18 points, No. 10 Pierce-Arrow, 12 points, No. 14 White, 152 points.

This day will live long in the history of motordom as the most spectacular day's run ever made in an endurance tour. The run proper started after all the cars had done what would be considered 2 fair days' work and finished with a wild sprint through the blackness of a moonless night to save penalization. That it did not result in fatalities must be credited to a watchful providence, for a more terrific and spectacular drive never took place at night.

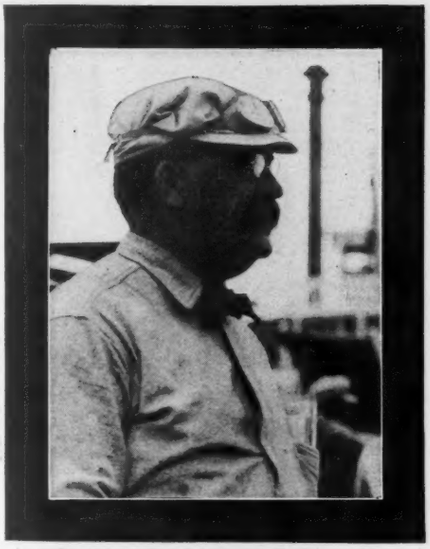
The cars did not check out at Roanoke according to schedule because the ford across Back creek, 5 miles from Roanoke, was reported to be 4 feet deep. When the cars reached the creek it had gone down to a large extent and fifty cars managed to cross under their own power. The rest were stalled in the creek and had to be dragged out by mule-power. After this experience the caravan climbed to the summit of the Blue Ridge and eventually reached the point that had been named as emergency checking-out station. This was 40 miles from Roanoke, 20 miles north of Martinsville and over 80 miles from this place.

It was 4 o'clock before the main body commenced the run and black dark by the time Martinsville was reached, the way being exceedingly difficult.

Only a momentary stop was made at Martinsville for gasoline and then the cars took the road for the wildest run a tour ever made. There was not a glimmer of light to guide the drivers through the pine forests save that afforded by the lamps of the cars. Reaching high into the sky, the trees cut off the twinkling rays of the stars and the kindly moon was not present to ameliorate the condition. The road was vastly better than it had been in the mountains, but it was only a soft surfaced clay road at its best. As the route reached further and further toward night control the road became smoother and the drivers pressed down upon their throttles and raised the pace from 12 miles an hour to 20. They could not see, but as nothing happened the pace grew hotter until some of the cars were traveling 35 miles an hour. It required all that to reach control within the limit and, astonishing as it may seem, only thirty out of the competing battalion failed to check in clean.

The chief sufferer as far as the score is concerned is the Metz factory team, which had a clean score going into Roanoke, despite the terrific rain and slippery roads of yesterday. The Metz trio started late from Roanoke so as to take advantage of the moderation of the creeks and consequently was late checking out. This put the little cars at a disadvantage inasmuch as they had to make their whole run in the dark. A broken wheel retired No. 17 and both its teammates turned in late at Winston-Salem.

Samuel McKnight Butler



Born December 13, 1866, at Camden, N. J. Died October 25, 1911. Chairman of contest board American Automobile Association. Formerly secretary Automobile Club of America. Member and first secretary of Aero Club of America. Member of First Signal Corps, United States army, serving 12 months in Cuba in Spanish-American war

The team to profit most by the retirement of the Metz is the Maxwell factory trio which made control on time and consequently have the only perfect team-score remaining.

The big cars suffered severely, three of the highest powered cars in the tour getting stuck in the mud at places where gasoline and oil were not available and which caused penalties.

The tourists were given a delightful greeting at Winston-Salem, the whole town turning out to welcome them.

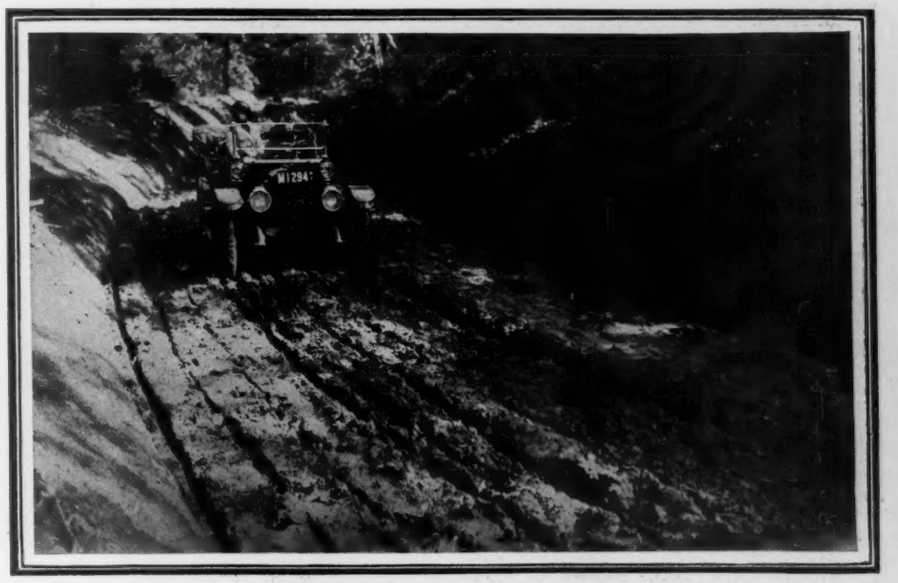
To Charlotte

Charlotte, N. C., Oct. 19—Not reported: No. 16 Metz and No. 72 Haynes. No. 10 Pierce-Arrow was penalized 14 points, No. 14 White, 1,000 points, No. 15 Metz, 24 points.

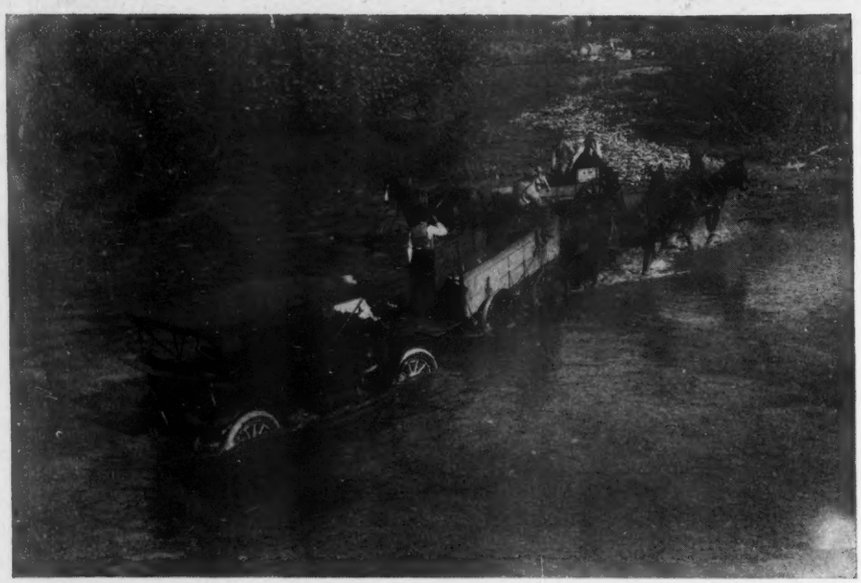
North Carolina has good, passable roads. They are mostly composed of yellow clay, with a little red here and there, and the Glidden cars, under delightful weather conditions for the first time during the run, made the schedule today without much trouble. There were quite a number of penalizations, but most of them resulted from the hard work of the 2 previous days.

The state has one county where the roads are neglected and the tour passed through it before reaching noon control. This was Davidson county, of which Lexington is the county seat. On both sides the roads were asy to travel, but in Davidson county they were badly worn, rutted and neglected. One mud-hole held up forty cars for 30 minutes, but as the other roads were good, the tourists did not suffer materially in their scores.

The Maxwell team retained its lead and its perfect scores. It represents Tarrytown, N. Y., and driven by three men who are accustomed to contest work—all of them trade drivers—it is thought the team will maintain its perfect score to



TOURISTS FOUND 25 MILES OF THIS SORT OF GOING



REO IN MUD 3 MILES OUT OF ROCKY MOUNT

SOME FORDS SO DEEP HORSES HAVE TO HELP

HORSEMAN TESTING DEPTH OF A FORD

the end of the tour. Tire troubles and a case or two of defective lubrication and heated motors about summed up the situation from a penalty point of view.

To Anderson

Anderson, S. C., Oct. 20—Not reported: No. 15 Metz and No. 16 Metz. The following were penalized: No. 7 White, 9 points, No. 60 Oldsmobile, 39 points, and No. 71 Case, 8 points.

The seventh day's run was uneventful as far as general results are concerned, but it was interesting in as much as it traversed the heart of the southeastern cotton section. All day long the Glidden cars passed between fields of ripe cotton in which emphatically brunette laborers were busy. The further south the tour gets the whiter is the cotton and the blacker the negroes.

There were no major changes in the scores today, the standing remaining relatively as it was yesterday and the day before. The Oldsmobile team fell back from fourth to fifth position as the result of the demerits imposed on car 60 for tire trouble.

To Atlanta

Atlanta, Ga., Oct. 21—Not reported: No. 60 Oldsmobile and No. 71 Case. The following were penalized: No. 33 Cole, 19 points, No. 46 White, 4 points, No. 59 Cadillac, 23 points and No. 65 Oldsmobile, 17 points.

With an escorting column consisting of about 1,500 cars and 15,000 human beings, the Glidden column entered Atlanta today, completing the eighth day of the 1911 tour. The demonstration here was entirely unprecedented in size and enthusiasm and it is doubtful if any returning conquerors were ever received more heartily than were the Gliddenites by Atlanta.

The town is wide open in its greeting, as may be indicated by the fact that each tourist has in his possession an engraved invitation to make himself at home at nine different exclusive clubs and organizations. The town did itself proud in its greetings, but it almost finished the chances of several of the clean score cars by the strenuousness of the parade that followed checking-in.

The run today was hard, hot and tiresome and at the end many of the cars needed water. As a consequence of the tedious, slow and interrupted course through the city, the cars had their troubles. No. 3 Maxwell, perfect score, seized a piston twice during the run and several others well up on the list were more or less affected.

These cars may get no demerits on the Tuesday run as far as Valdosta, but before them still lie the heavy sand roads of Florida. The most serious incident in today's run was the mishap to No. 60 Oldsmobile, which broke a steering yoke and spindle in a chuck-hole north of Com-

merce, Ga. The car is being repaired and will rejoin the tour here. In fact, nearly all the cars that have been withdrawn or ruled out on account of heavy penalizations wil be in at the finish. The other demerits today resulted from tire trouble almost entirely.

The Maxwell factory team retains its lead for the Glidden trophy with a clean score. Next in order is the Stevens team with 19 points. Then comes the team composed of Cadillacs 32, 40 and 47 with 23 points. The Ford team is fourth and the others are apparently out of the running.

In the contest for the Anderson cup there are still seventeen clean scores, including four Maxwells, two Stevens, two Mitchells, two Fords, three Cadillacs and one each Thomas, American, Columbia and Flanders. This list will be sharply abbreviated before the last control is reached, the cup going to the car with the best individual score for the run. In case of a tie, it will be necessary to draw lots.

An extremely pleasant program has been arranged for the long control in Atlanta, including dinners, barbecue and theater party. It is estimated that the cars that escorted the tourists into town were worth upward of $3,000,000.

To Cordele

Cordele, Ga., Oct. 24—No. 71 Case was penalized 9 points and No. 64 Pierce-Arrow and No. 46 White were withdrawn.

Over excellent roads the Glidden tour traveled from Atlanta to Cordele today, making 167 miles with fewer demerits than any day since leaving New Jersey.

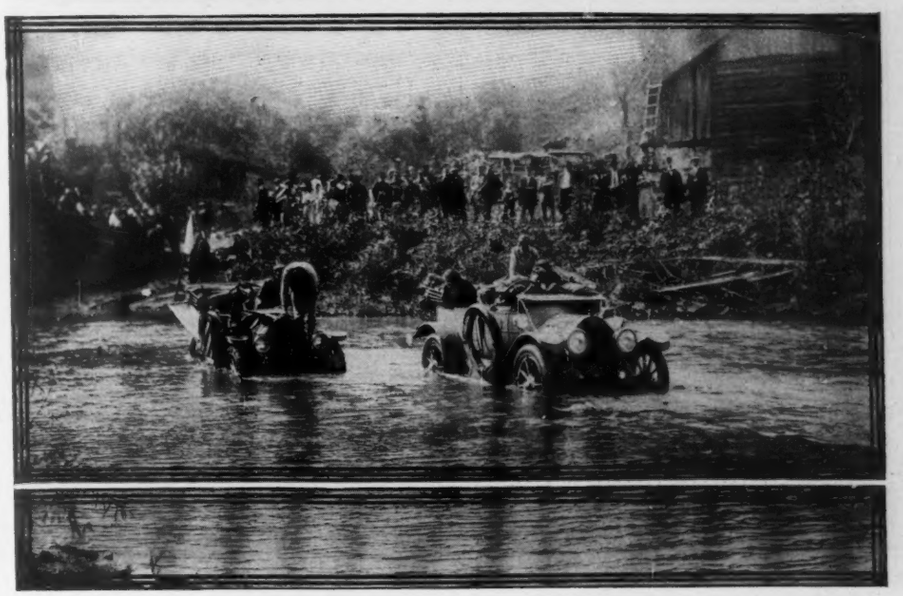
The Georgia roads have been built largely within 2 years and while they are not perfect at this time, they are so much better than the majority of the going experienced so far that they seem like boulevards.

Case car 71 drew the only penalization for the day, turning up 9 minutes late at Macon as the result of tire trouble. This car was so late Saturday that it was not reported, but is continuing as a contest until its status is definitely established. Pierce-Arrow 64 and White 46, both Atlanta, fell out at their home town.

Relative standings were not disturbed by today's run, the Maxwell team maintaining its lead. There was general tightening up of mechanism today and preparation for the trial to be endured in the Florida sands tomorrow afternoon and Thursday.

TROUBLE OVER COAST RUN

San Francisco, Cal., Oct. 21.—The Los Angeles endurance run came to a close Wednesday night, when seven cars checked in at San Francisco after a run of more than 1,000 miles. This is the first endurance run ever held between these two points, and the longest ever held in the state. Not one of the seven cars that took part in the contest came



PULLING CARS OUT OF MUD AT PECK CREEK, VA.

A LITTLE STREAM BUT STILL A HAZARDOUS ONE

ANOTHER VIEW OF GLIDDENITES AT PECK CREEK

PICTURESQUE GOING FOUND IN VIRGINIA

STANDING OF TEAMS IN GLIDDEN TOUR

Standing of the teams still running for Glidden trophy:

	1	2	3	4	5	6	7	8	9	Car Totals	Team Totals
TARRYTOWN, N. Y.											
1 Maxwell	0	0	0	0	0	0	0	0	0	0	
2 Maxwell	0	0	0	0	0	0	0	0	0	0	
3 Maxwell	0	0	0	0	0	0	0	0	0	0—	0
ATLANTA NO. 2											
11 Stevens-Duryea	0	0	0	0	0	0	0	0	0	0	
39 Stevens-Duryea	0	0	0	0	0	0	0	0	0	0	
66 Stevens-Duryea	0	0	0	10	9	0	0	0	0	19—	19
JACKSONVILLE											
32 Cadillac	0	0	0	0	0	0	0	0	0	0	
40 Cadillac	0	0	0	0	0	0	0	0	0	0	
47 Cadillac	0	0	0	23	0	0	0	0	0	23—	23
ATLANTA NO. 3											
43 Ford	0	0	0	125	0	0	0	0	0	125	
44 Ford	0	0	0	0	0	0	0	0	0	0	
45 Ford	0	0	0	0	0	0	0	0	0	0—	125
EVERGLADES											
33 Cole	0	0	0	87	13	62	0	19	0	181	
46 White	0	0	0	4	42	0	0	4	1000	1050	
48 Cadillac	0	0	0	0	0	0	0	0	0	0—	1231
FLORIDA											
28 Cadillac	0	4	0	0	0	0	0	0	0	4	
29 Cadillac	0	0	0	226	0	0	0	0	0	226	
37 Cadillac	0	0	0	0	3	11	0	0	0	14—	244
LIVE OAK											
31 Cadillac	0	0	0	0	249	0	0	0	0	249	
51 Cadillac	0	0	0	13	0	0	0	0	0	13	
74 Cadillac	0	3	0	0	0	0	0	0	0	3—	265
ATLANTA NO. 1											
8 Flanders	0	0	0	0	0	296	0	0	0	296	
63 Flanders	0	0	0	0	104	0	0	0	0	104	
61 Flanders	0	0	0	5	0	0	0	0	0	5—	405
NASHVILLE											
56 Marathon	0	0	0	72	153	0	0	0	0	225	
57 Marathon	0	0	0	0	210	0	0	0	0	210	
58 Marathon	0	0	0	9	34	0	0	0	0	43—	478
DETROIT											
53 Flanders	0	591	0	0	0	21	0	0	0	612	
54 Flanders	0	0	0	0	0	0	0	0	0	0	
55 Flanders	0	0	0	416	0	0	0	0	0	416—	1028

through with a perfect score. The final penalties of each car were announced tonight as follows:

	Points
1—American	87
2—Warren-Detroit	487
3—Flanders runabout	857
4—American	977
5—S. G. V.	1195
6—Cartercar	2030
7—Flanders touring	2048

The American is declared the winner of the run, and is awarded the Fernando Nelson cup. The Warren is given the Stockton hotel cup, and the Flanders run-about the Hudson trophy. The two American entries received the Hotel Potter cup, as the team making the best score. A great deal of dissatisfaction is the outcome of the contest. It is claimed that the rules of the A. A. A. regarding the change of observers on the different cars was not strictly adhered to, and it is further charged that some of the observers failed to report work done on some of the cars. The Flanders representative stated that he would appeal to the A. A. A. to grant no further sanctions to the Good Roads Club, which promoted the contest. Other contestants announced that they would appeal from the formal report of the referee.

INDIVIDUAL SCORES

27	Chalmers	13
*42	E-M-F	2164
26	Mitchell	81
41	Winton	54
52	Packard	14
59	Cadillac	146
70	Krit	45
*71	Case	1429
*72	Haynes	1728
73	Mitchell	Perfect

*Withdrawn

SCENE AT NATURAL BRIDGE
Gliddenites found fire department is using motor apparatus

OKLOHOMA CONDITIONS

Enid, Okla., Oct. 21—Probably nowhere in the United States is the motor car more appreciated than it is in Enid, and the northwest part of the state; the city and country being so located that the practicability of the car cannot be more thoroughly demonstrated than it is in this section of the country; a broad, expansive territory practically smooth and level, as all farms embrace 160 acres or more, consequently many Oklahomans are located

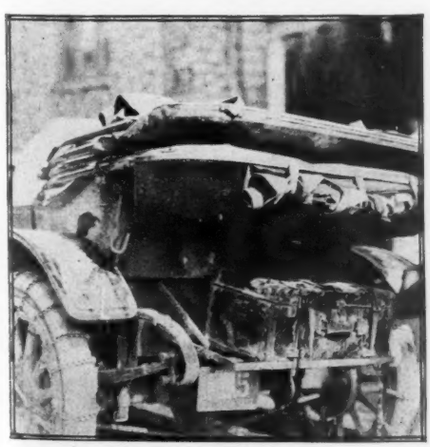
PREPARING FOR A FORD
When streams are approached radiators are blanketed to keep out the water

HAPHAZARD PACKING
After a hard day's run the average tonneau was in this condition

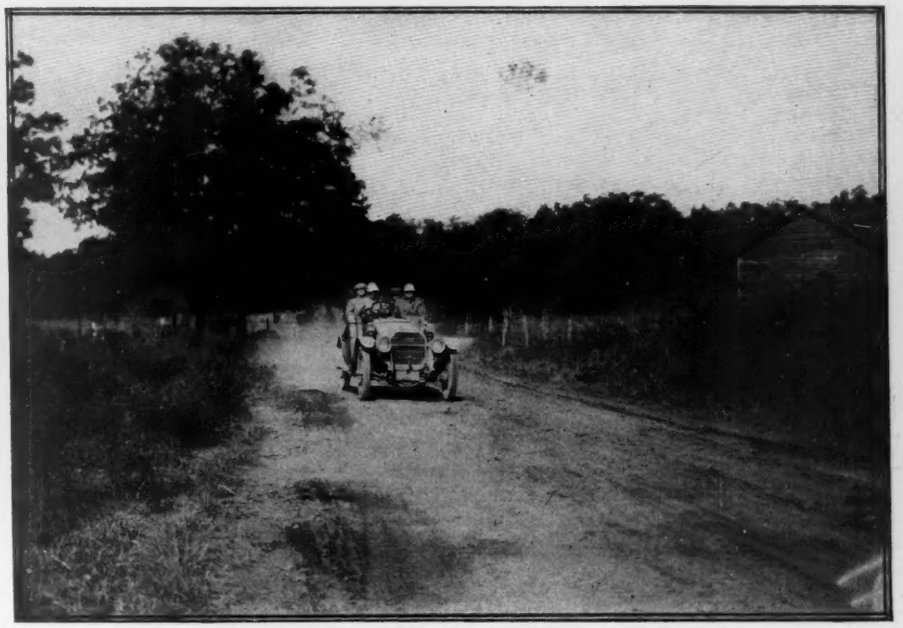
a considerable distance from trading centers, and while it is a simple matter of traveling 15 or 20 miles with a motor car, it is quite a task to make the trip with team and vehicle, consequently the car is appreciated probably more in these instances for its practicability than in a more thickly settled country. So practicable has the motor car become that large numbers of them are being purchased by the farmers, not as a vehicle of luxury, but as the means of more rapidly transacting their business.

Probably nowhere could a natural road appeal more strongly to the motorist than does the public roads in this part of the state, as all highways are built on section lines and the natural earth is of such a nature that it cannot be excelled for this purpose.

From the very start of the motor car business in northwestern Oklahoma, Enid became the center of it, as from it radiates ten lines of railroad, tapping all this section of the state, but as the business grew almost every city of any size built its garage, and from these garages there has been sold in the last few years hundreds of cars. In the city of Enid and vicinity there are something like 300 cars, and about half of these are owned by



TOUR DAMAGES TOPS
This is the way tops looked after Gliddenites had been out a week



ALL ROADS NOT UNDER WATER—NEAR GREENSBORO, N. C.

SCORES OF OTHER GLIDDEN TOUR CARS

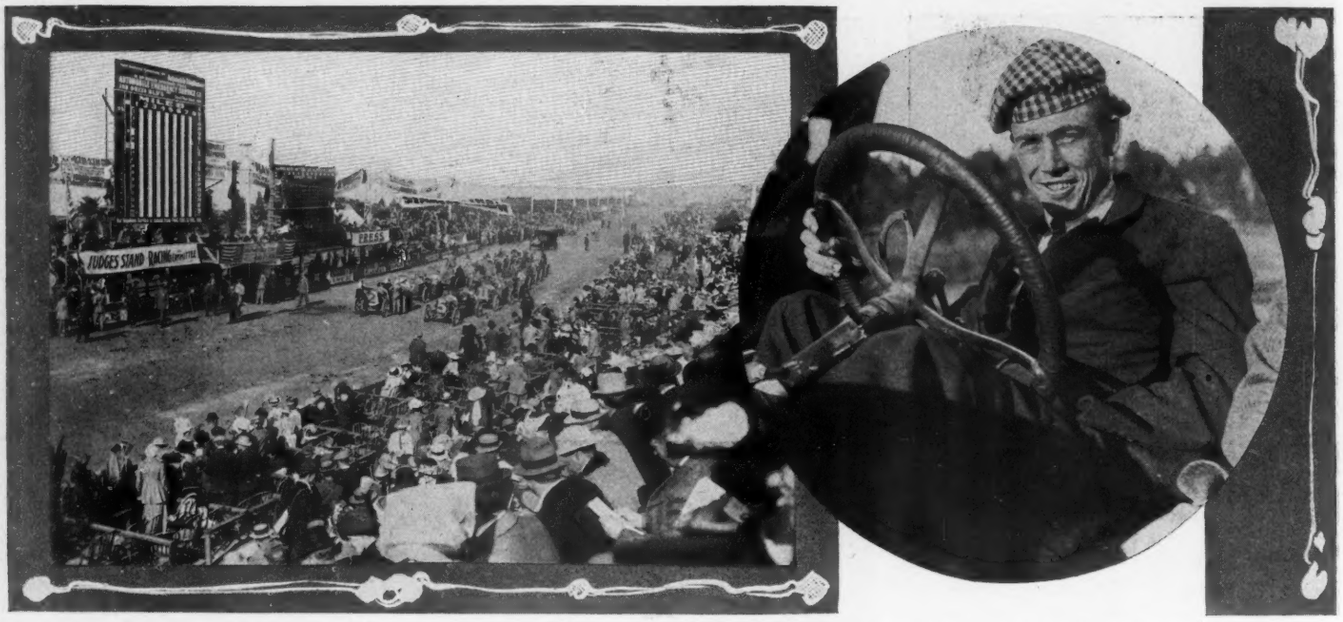
The following teams are no longer competing for the Glidden trophy, by reason of the withdrawal of one car each from the contest:

	1	2	3	4	5	6	7	8	9	Car Totals	Team Totals
GEORGIA-DIXIE											
4 Maxwell	0	0	0	0	0	0	0	0	0	0	
49 Columbia	0	0	0	0	0	0	0	0	0	0	
50 Maxwell	0	0	0	1000	0	0	0	0	0	1000	—1000
ATLANTA JOURNAL											
5 American	0	0	0	0	0	0	0	0	0	0	
6 Thomas	0	0	0	0	0	1000	0	0	0	1000	
7 White	0	0	0	0	18	0	9	0	0	27	—1027
ATLANTA NO. 4											
10 Pierce-Arrow	0	0	0	0	12	14	0	0	0	26	
12 Marmon	0	0	0	0	0	1000	0	0	0	1000	
64 Pierce-Arrow	0	0	0	3	105	0	0	0	1000	1108	—2134
CORDELE											
60 Oldsmobile	0	0	0	4	81	26	39	1000	0	1150	
65 Oldsmobile	0	0	0	0	0	0	0	17	0	17	
69 Oldsmobile	0	0	0	1	0	0	0	0	0	1	—1163
ALBANY, GA.											
34 Halladay	0	63	0	0	0	0	0	0	0	63	
35 Halladay	0	0	0	0	228	0	0	0	0	228	
36 Halladay	0	31	0	0	0	1000	0	0	0	1031	—1322
WALTHAM, MASS.											
15 Metz	0	0	0	0	130	24	6	0	0	160	
16 Metz	0	0	0	0	57	0	328	0	0	385	
17 Metz	0	0	0	0	1000	0	0	0	0	1000	—1545
ATLANTA NO. 6											
18 Garford	0	0	0	960	10	0	0	0	0	970	
19 Mitchell	0	0	0	0	0	0	0	0	0	0	
20 Sacht	0	0	0	0	0	1000	0	0	0	1000	—1970
ATLANTA NO. 7											
21 Corbin	0	0	0	0	23	0	0	0	0	23	
14 White	0	0	0	152	981	1000	0	0	0	2133	
22 Thomas	0	0	0	0	0	0	0	0	0	0	—2156

farmers. In the purchasing of machines by the farmers, of course, crop conditions govern, and there never has been a season when it looked as though for another year's business that conditions could be any better, as we have had ample moisture for the plowing and putting in condition of the ground for the wheat, which is almost a sure indication of an immense crop the coming year. Upon the prospects of this crop will depend largely the business that the car dealer will do with the farmer, and at the present time this condition is very gratifying.

Enid is the largest city in the northwestern part of the state and is a railroad center, having more outlets by rail than any other city in the state, lines radiating in ten different directions. Few cities have such wide, beautiful asphalt-paved streets, which is the delight of all motorists. As the climate is mild and the evenings always cool and balmy, motoring is the principal mode of recreation, and the 30 miles of paving is many times traveled each evening, under the glare of the white way system of street lighting.

Almost all the cars sold in the city the past year have been of the higher-priced class, while the Overland, Ford, Maxwell and Hupmobile find more favor in the country. Summing it all up, the outlook is a bright one.



SCENE AT START OF SANTA MONICA RACES AND HERRICK, WHO BROKE RECORD IN NATIONAL

Aftermath of the Santa Monica Races

Winners In Recent Road Events Receive Their Prizes—Marmon and National Crews Ship Home—Meet Held Without an Accident, Despite Crowd of 75,000 That Looked On

LOS ANGELES, CAL., Oct. 20—The trophies and prize money for the Santa Monica road races were presented to the winners Monday. For winning the free-for-all in the National, Harvey Herrick received the Dick Ferris trophy and about $6,000 in money. This includes the prize money offered by the magneto and tire companies. Charles Merz, who won the heavy-car race in the National, received a cash prize and the Leon Shettler trophy. L. Nikrent, who drove the little Buick to victory in the light-car race, won the Chanslor & Lyon cup, and the Jepson trophy went to Keene, of the Marmon crew.

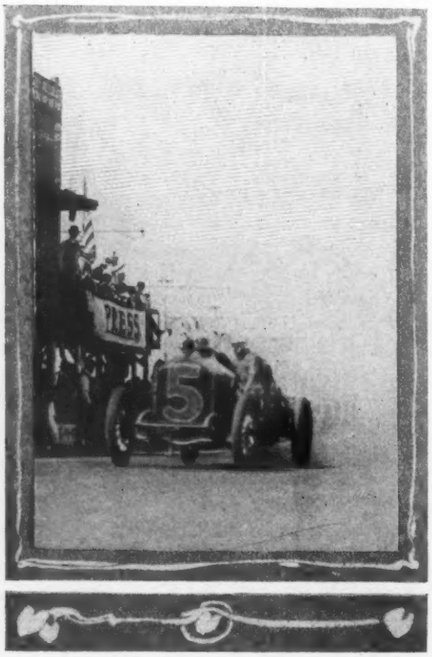
The Marmons were shipped home Monday, and Ray Harroun and his crew of ten men also left for the east. The National crew remained over until Friday. The National 50 and 40 used by Merz were shipped back,, to be prepared for the Savannah races. Herrick's car was left on the coast.

One noticeable feature of the Santa Monica road race was the perfect order kept by the thousands of people who surrounded the course. Around the entire 8 miles people in motor cars and afoot were massed. The crowd was estimated at 75,000, but at every point on the road the drivers were given the full width of the highway, and at not a single place did the people rush on the course to see the cars coming.

Another noticeable feature was the absence of accidents. Despite the fact that all American records were broken, not a person was injured. Harry Endicott failed to make a turn in the Inter-State, but was only bruised. During the 3 years of the Santa Monica road races there never has been a broken bone to mar the day's sport.

The timing was done by the Warner electrical timing system, in charge of W. H. Halliwell. The facilities provided for the press were inadequate.

Chairman A. M. Young of the racing committee announced that the race next year will be held in May at the time when the Shriners are holding the national convention.



MERZ WINNING

A revision of the time in the road races shows the following results in the free-for-all for the five cars that finished:

Car and Driver	Time
National, Herrick	2:42:24.6
Marmon, Patschke	2:45:42.7
Marmon, Dawson	2:47:54.53
National, Merz	2:49:24.53
National, Wilcox	2:50:53.6

Dingley, Pope-Hartford, twenty-three laps, 2:44:22.88; Lewis, Stutz, twenty-three laps, 2:49:42.66; J. Nikrent, twenty-two laps, 2:41:26.66; Hanshue, Mercer, twenty-two laps, 2:49:17.32; Tetzlaff, Fiat, twenty-two laps, 2:50:02.98; Endicott, Inter-State, three laps, 21:03.2; Duby, Midland, out first lap. As Tetzlaff was the big factor during the early part of the race his lap times are herewith given: 8:14. 14:52.65, 23:10, 30:49.8, 38:24.29; 45:32.25; 57:24.28; 65:21.22, 72:45.35, 80:05.36, 87:17.93, 94:36.12, 101:51.91, 109:14.26, 117:28.92, 124:50.27, 132:00.72, 139:23.83, 146:43.97, 154:01.82, 162:02.29, 169:17.32.

The time of the four cars in the 301-450 class race is the same as telegraphed Motor Age last week, as follows:

Car and Driver	Time
National, Merz	2:02:08.45
Pope-Hartford, Dingley	2:03:26.35
Stute, Lewis	2:04:56.95
National, Herrick	2:05:04.55

In the 231-300 class race, three cars, not four, as reported, finished. L. Nikrent in the Buick was in the last lap when the flag dropped. The time of the other three was:

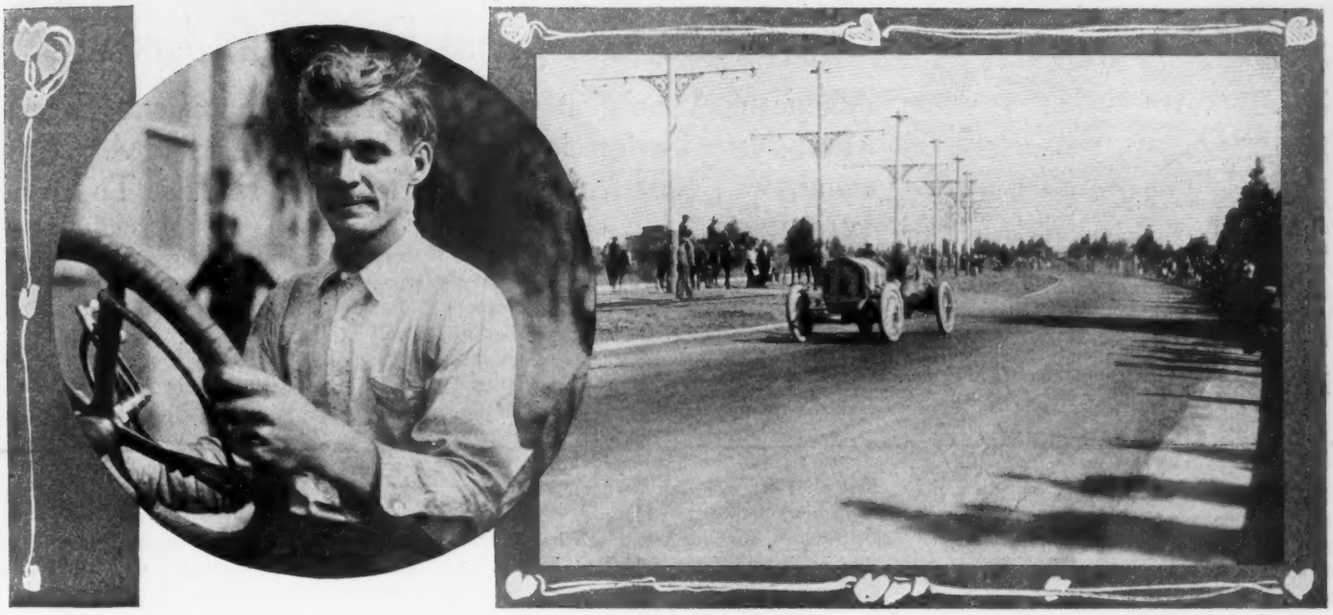
Car and Driver	Time
Marmon, Keene	2:12:09.95
Marmon, J. Nikrent	2:13:03.5
Mercer, Hanshue	2:13:41.2

The time of the others as far as they went was: L. Nikrent, Buick, seventeen laps, 2:07:35.8; McKeague, Durocar, sixteen laps, 2:05:15.55; Jenkins, Cole, sixteen laps, 2:20:30; Bigelow, Lexington, sixteen laps, 2:21:51.2; Jeffkins, Schacht, fifteen laps, 2:14:20.2; Siefert, Cole, twelve laps, 1:50:36.80.

Eight started in the race under 230 inches, and three finished, as follows:

Car and Driver	Time
Buick, L. Nikrent	1:42:21.7
Ford, Charles	1:45:22.85
E M F, Seibel	1:55:50.2

Other time: Soules, Flanders, twelve laps, 1:58:38.45; Hanshue, Reo, ten laps, 1:27:14.6; Fleming, Locomobile, ten laps, 1:50:36.1; De Quelin, Sunset, eight laps, 1:15:49.95; Smith, Maxwell, two laps, 17:08.7.



LOUIS NIKRENT, BUICK, AND HERRICK WINNING FREE-FOR-ALL

Road Racers Drive in Speedway Meet

Tetzlaff in Fiat Stars in 2-Day Meet Run on Los Angeles Motordrome—Bert Dingley Also a Factor in Speed Battles—Hanshue in Mercer Figures Among the Other Winners

LOS ANGELES, CAL., Oct. 22—The usual fast time marked the 2-day speedway motordrome meet. Five thousand people saw Saturday's sport and 10,000 crowded the pie-pan today. The feature Sunday was the match race between Tetzlaff in a Fiat and Lee Oldfield in a second Fiat. Tetzlaff won two straight 2-mile heats in 1:18.57 and 1:17.9. These cars also hooked up in the two 5-mile free-for-all events. Tetzlaff won the first in 3:19.25. Oldfield was 4 seconds behind. The Inter-State, with H. Endicott driving, took third. In the second free-for-all Oldfield beat Tetzlaff in 3:20.33. Dingley in the Pope was third.

The 5-mile race for cars under 600 cubic inches piston displacement was easy for Bert Dingley. The Schacht also had an easy time winning the 10-mile 231-300 class, and the 25-mile race for the same class. Tetzlaff and Dingley fought out the free-for-alls Saturday. Both 5-mile races were fights, the Pope finishing a close second each time. Hanshue in the Mercer was an easy winner in the 10 and 25-mile races for his class. Dingley won the handicap Saturday and was beaten by Endicott in the Inter-State Sunday. Endicott had 13 seconds in 5 miles. Summaries:

SATURDAY

Five miles, 161-230 class—Anthony, Regal, won; Smith, Maxwell, second; Endicott, Reo, third; time, 4:25⅕.

Ten miles, 231-300 class—Hanshue, Mercer, won; Jeffkins, Schacht, second; Carlson, Cole, third; time, 7:45⅕.

One mile time trial—National, Herrick; time, 0:44⅘.

Five-mile free-for-all—Tetzlaff, Fiat, won; Dingley, Pope-Hartford, second; Lewis, Stutz, third; time, 3:25⅘.

Twenty-five miles, 231-300 class—Hanshue, Mercer, won; Carlson, Cole, second; Anthony, Regal, third; time, 20:59⅕.

Five-mile handicap free-for-all—Dingley, Pope-Hartford, won; Anthony, Regal, second; Endicott, Reo, third; time, 3:58⅘.

Five-mile free-for-all—Tetzlaff, Fiat, won; Dingley, Pope-Hartford, second; Endicott, Inter-State, third; time, 3:33⅕.

KEENE'S MARMON ON DEAD MAN'S TURN AND JOE NIKRENT, MARMON DRIVER

SUNDAY

Five miles, under 600 cubic inches—Dingley, Pope-Hartford, won; Endicott, Inter-State, second; Lewis, Stutz, third; time, 3:40.2.

Ten miles, 231-300 class—Shain, Schacht, won; Carlson, Cole, second; Anthony, Regal, third; time, 7:55.

Ten miles, 161-230 class—Smith, Maxwell, won; Anthony, Regal, second; Endicott, Reo, third; time, 8:42.41.

Five-mile free-for-all—Tetzlaff, Fiat, won; Lee Oldfield, Fiat, second; Endicott, Inter-State, third; time, 3:19.35.

Twenty-five miles, 231-300 class—Shain, Schacht, won; Carlson, Cole, second; Anthony, Regal, third; time 19:49.57.

Five-mile free-for-all—Lee Oldfield, Fiat, won; Tetzlaff, Fiat, second; Dingley, Pope-Hartford, third; time, 3:20.33.

Two-mile match race, two heats—Tetzlaff, Fiat, won; Lee Oldfield, Fiat, second; time, 1:18.57 and 1:17.9.

Five-mile handicap—Endicott, Inter-State, won; Dingley, Pope-Hartford, second; Anthony, Regal, third; time, 4:02.98.

PEARCE KILLED AT SIOUX CITY

Sioux City, Ia., Oct. 22—The Sioux City Automobile Club has just completed a successful race meet which was run Friday and Saturday. It had been intended to have racing today but rain forced the promoters to abandon the idea. While the meet was successful from a racing viewpoint, it was marred by an accident Thursday when W. H. Pearce, of the Colby team, was killed in practice. On a turn Pearce shot into the inside fence and was caught in the wreckage. Broken ribs on the left side penetrated his heart and caused almost instant death. Pearce was a Chicagoan and well known in the racing world. Last year he was a member of the Falcar team and was second in the Wheatley Hills cup at the Vanderbilt meet. Driving a Colby this season, he was third in the Kane County cup at Elgin. He also started in the Cincinnati road race.

The best race the first day of the meet was the 25-mile event, which was won by John Sparling in a Buick in 25:27. The second day there was a 50-mile free-for-all, won by Wetmore in a Chalmers. The second day the judges revised the ruling in the Australian pursuit race of Friday and gave the race to Wells in the Moon. Summaries:

FRIDAY

Ten miles, 161-230 class—Shrunk, Paige-Detroit, won; Gnehm, Reo, second; Ralston, Ford, third; time, 10:12. Also started: Chalmers, E-M-F, Abbott-Detroit, Michigan.

Ten miles, 301-450 class—Sparling, Buick, won; Woodruff, Jackson, second; Delaney, Cutting, third; time, 10:42.

Australian pursuit race, 10 minutes—Wells, Moon, won. Also started: Callioutte, Moon, Buick, Chalmers, Maxwell, Abbott-Detroit.

Twenty-five mile free-for-all — Sparling, Buick, won; Shrunk, Paige-Detroit, second. Also started: Moon, Chalmers, Reo, Ford, Jackson, Cutting, Abbott-Detroit, E-M-F and Moon.

SATURDAY

Ten miles, 161-230 class—Shrunk, Paige-Detroit, won; Wetmore, Chalmers, second; Gnehm, Reo, third; time, 11:04. Also started: Ford, E-M-F, Abbott-Detroit, Michigan.

Ten miles, 301-450 class—Sparling, Buick, won; Woodruff, Jackson, second; time, 10:17. Also started: Moon.

Fifty mile free-for-all—Wetmore, Chalmers, won; Smith, Abbott-Detroit, second; Sparling, Buick, third; time, 56:57. Also started: Paige-Detroit, Ford, Moon, E-M-F and Michigan.

KANSAS CITY SHOW DATES

Kansas City, Mo., Oct. 23.—At the largest and most enthusiastic meeting that has ever been held the Kansas City motor car dealers, the combined associations, decided to hold a motor car show February 12 to 17.

Big Road Congress Program Arranged

American Association for Highway Improvement Secures Many Notables for Session Which Will Be Held At Richmond, Va., Next Month—Prominent Men Promise To Speak

WASHINGTON, D. C., Oct. 23—In the iofficial program of the road congress to be held by the American Association for Highway Improvement at Richmond November 20-23, 1911, there is a list of speakers which includes the most notable scientists and public men ever gathered together for any one convention. The program, which has just been announced, includes an address by President Taft, the first that he will deliver upon his return from his long western trip.

Previous announcement has been made that on national day, which will mark the opening of the congress of the association and its allied organizations, the speakers will include Governor Mann of Virginia, Senators Martin and Bankhead and Congressman J. Hampton Moore and others.

In the official program, however, it is set forth that Harold Parker, chairman of the Massachusetts state highway commission, will preside, and that 20-minute papers will be read by W. A. McLean, provincial engineer of Ontario, Canada; W. W. Crosby, state highway engineer of Maryland; A. N. Johnson, state highway engineer of Illinois; A. H. Blanchard, professor of highway engineering, Columbia university; P. St. J. Wilson, state highway commissioner of Virginia.

On road-users day, which will follow the second day, set aside for manufacturers, the motorists will have their innings. This part of the program is under the auspices of the Touring Club of America.

This part of the program will be devoted to a discussion of the various problems of traffic regulations, not merely from the standpoint of the motor cars, but from all other standpoints. James S. Harlan, member of the interstate commerce commission, will preside. The address of welcome will be delivered by Preston Belvin, on behalf of the state association and will be followed by J. T. Palmatary, president of the Richmond Automobile Club. Many other speakers will deliver short talks on various phases of the traffic problems, as presented in different sections of the country. They will include Senator Swanson of Virginia; Hugh Chalmers, of Detroit, and Colonel Charles Clifton, of New York.

PROGRESS OF PACIFIC HIGHWAY

San Francisco, Cal., Oct. 15—Having completed the marking of the Pacific highway through the states of Washington and Oregon, the Pacific highway commission has donated all its remaining signs to the California State Automobile Association, which will undertake the task of marking California from the northern boundary line down to Redding. At that point the road signs of the Automobile Club of California begin, so that there will soon be a perfectly marked highway from the Canadian border to the Mexican boundary line.

Frank M. Fretwell, secretary of the Pacific highway, who was in San Francisco a few days ago in the pathfinding Flanders 20, said: "The officials of the highway association are ambitious to have a first-class, all-the-year-round road by the time of the Panama-Pacific international exposition in 1915. Oregon has taken hold of the project energetically, and since the roads in that state are more in need of improvement than in any other section, their enthusiasm is most opportune. Practically every town of importance along the road of the Pacific highway sent out delegations to meet the pathfinders who marked the road through the state. The worst stretch of the Pacific highway north of San Francisco is between Redding and Dunsmuir. However, Shasta county is rapidly overcoming this bad gap, as it lately has opened up a stretch of more than 35 miles of beautiful mountain road along the Sacramento canyon, building the grades not to exceed 8 per cent. There remains about 20 miles yet to be built, which will eliminate all of the really bad road in California along the northern and southern highway routes."

YOUNG QUAKERS IN TOY RACE

Philadelphia, Pa., Oct. 21—An imitation of the Fairmount Park road race on a miniature scale, duplicating that famous event in every detail, furnished excitement and amusement in West Philadelphia today, the occasion being a pushmobile race between a score of machines manned by as many youthful drivers and mechanicians. Each pushmobile carried out the color scheme of the racer it was named after, numbers were painted on in a conspicuous place and the youngsters even temporarily assumed the names of well-known speed drivers. The start and finish of the contest were at Fifty-fourth and Pine streets and a ½-mile course was laid out with enough curves and dips to cause thrills. The course had to be negotiated eight times. Cars were sent off at 10-second intervals. Boys with red flags were stationed along the course to guard the way. The Ohio won, National second and Mercer third. The winner's time for the 4 miles was 19 minutes 20 seconds. All told there were represented in the race three Fiats, five Nationals, three Mercers, Stoddard-Dayton, three Loziers, two Ohios, Simplex, Case, Mercedes, Bergdoll, Chalmers, and a Cole.

Motoring Paradise Promised 'Frisco

San Mateo County, California, Is Planning To Spend $3,000,000 on Road Improvement Which Will Afford Coast Owners an Exit Into Beautiful Country—Boulevard Scheme

SAN FRANCISCO, Oct. 17—San Mateo county, adjoining San Francisco on the peninsula to the south, and one of the most beautiful counties in the entire state, is planning to construct an elaborate system of highways throughout its boundaries, to cost $3,000,000. Noted heretofore for the wretched condition of its roads, while possessing magnificent scenic drives, San Mateo now plans to make its roads the best to be found within the confines of the state. At a meeting held last the board of supervisors instructed that steps be taken at once for the holding of a bond issue election.

It is proposed to provide for three boulevards, running north and south the entire length of the county, to be connected by laterals that will traverse the county from the bay shore to the ocean. One of the main highways will be an ocean boulevard, another will follow the bay shore and the third will be along El Camino Real, at present the main artery of travel.

The plan for the great system of highways has been carefully prepared by the San Mateo Development Association. Should the bond issue carry and the roads be constructed, it will be a great thing for the motorists of San Francisco and will give a good boost to the motor business in this city. At the present time San Francisco motorists are loath to get into San Mateo county any more than necessary because of the roughness of its roads, and as San Mateo is their only outlet by land, they elect to cross the bay or stay at home. It is this isolation that to some extent has held back the motor car business of this city. With fine roads into San Mateo county, affording charming drives right at San Francisco's door, it is believed that the volume of sales will increase.

ILLINOIS STATE ELECTION

Chicago, Oct. 21—The annual meeting of the Illinois State Automobile Association was held at the rooms of the Chicago Motor Club Thursday evening and resulted in the retention of the old officers, A. J. Williford, of Nokomis, being re-elected to the presidency. There were some changes among the other officials, W. P. Graham, of Rochelle, being chosen first-vice-president; J. B. McGuire, of East St. Louis, second vice-president; Arthur Ware, of Hillsboro, third vice-president. The following directors were chosen: Dr. H. A. Gunther and C. G. Sinsabaugh, Chicago Motor Club; R. J. Ton, Roseland; R. D. Raggeveen, Blue Island; C. G. Miller, Cairo; Dr. C. H. Lockhart, Witt; T. M. Beatty, Quincy; C. F. Miller, Spring Valley; H. Van Vredenbergh, Springfield, and W. D. Snow, Bloomington. The four executive officers constitute the membership committee; J. B. McGuire is good roads chairman and Harry Lewis, of the Chicago Motor Club, legislative chairman.

MICHIGAN ROAD CONDITIONS

Grand Rapids, Mich., Oct. 21—Next year the people of Michigan will spend millions of dollars in the bettering of roads in the Wolverine state. This is not a prediction, but a fact. The campaign of education has been a long one, but today the farmers, car owners, city merchants and all who might profit through the bettering of the highways have been brought to see the value of improvement and as a result "good roads for Michigan" has become the slogan in every part of the state. The recent meetings of county supervisors have been productive of excellent results in that in many counties propositions for bonding for better roads will be submitted with every chance of success.

Kent county, in which is located the city of Grand Rapids, will vote on a proposition to bond the county for $600,000 for the purpose of improving highways. From present indications the proposition has an excellent chance of being carried. Kent county has been under the district good roads system for some time. That is, the city of Grand Rapids, together with several adjoining townships, formed themselves into a good roads district a few years ago for the purpose of bettering the highways in the district.

Bridgeport and Birch Run, in Saginaw county, have voted $26,000 for good roads and it now is assured that at least $100,000 will be spent in that county in the cause of improved highway conditions. The merchants of Birch Run gave a $1,000 bonus to the road fund following the adoption of the proposal. The supervisors of the county have accepted the proposition of several business men that they advance $27,000 for road work, they to be reimbursed as the tax of the city of Saginaw is paid to the county for road work.

In the vicinity of Six Lakes and Greenville in Montcalm county road work is being rushed at all possible speed and it is believed that the running time for motor cars between Grand Rapids and Greenville, a distance of about 40 miles, will be reduced greatly.

Fifty-seven thousand dollars will be spent in Berrien county, in which are located the twin cities of Benton Harbor and St. Joseph, during the coming year, the supervisors having adopted the report of the good roads commissioners recommending a 2-mill tax for this purpose.

Mecosta county is likely to get into the game at the January session of the supervisors, a proposition to bond the county for $50,000 for that purpose having been deferred until that time.

BIG PARTY TO DEDICATE ROAD

St. Louis, Mo., Oct. 23.—Curtis Hill, Missouri state highway engineer, spent several days in St. Louis arranging the details for the party of St. Louis motorists who will leave in fifty or more cars October 27 to take part in the dedication ceremonies of the new cross-state highway at Columbia, October 28. The road is announced to be in good condition, and will be marked by flags from St. Louis to Columbia. The party will leave Friday morning, passing through St. Charles, St. Peters, O'Fallon, Wentzville, Foristel, Wright City, Warranton, Jonesburg, Mineola Springs, Williamsburg and Fulton, where the Friday night stop will be made. The cars will proceed to Columbia Saturday morning, where they will meet similar parties from Kansas City.

EIGHTEEN ON CHICAGO RUN

Chicago, Oct. 23—Eighteen cars entered in the fifth annual reliability run of the Chicago Motor Club, which starts Friday for a 1300-mile trip through five states. In the touring car class there are entered two Molines, two Halladays, two Staver-Chicagos and one each of the Case, Lion, Abbott-Detroit and Oldsmobile. The roadster division includes two Molines, two Velies, and one each of the Oakland, Bergdoll, National and a Grout. The itinerary of the tour calls for night stops at Indianapolis, Louisville, Cincinnati, Columbus, Detroit and Grand Rapids. Sunday will spent in Louisville. In addition to the contestants there will be several official cars—a Halladay pilot, a Velie pacemaker, a National press car and a Midland checker's car.

BENZ AND FIAT RACERS READY

Paris, Oct. 16—The racing cars prepared by the Benz and Fiat companies for the grand prix race at Savannah on November 30 have just undergone their first road trials. The Benz racers are four-cylinder models of 130 by 180 millimeters bore and stroke—5.1 by 7.08 inches—declared to develop about 125 horsepower and to be capable of a speed of 105 miles an hour on the level. The total weight empty is only 1,760 pounds, and about 2,400 pounds in full running condition. The Fiat engineers have adopted a bore and stroke of 125 by 190 millimeters—4.9 by 7.48 inches—from which it is expected to get the same power and the same speed as the Benz models. Weight has been kept low, being not much more than 2,400 pounds, ready for the road.

Governor Worries Car Manufacturers

Michigans Executive in Speech Shows State Is Contemplating Forcing Motor Industry To Pay More Taxes—R. C. Hupp Files Answer To Bill Filed By the Hupp Motor Car Co.

DETROIT, Mich., Oct. 25—The chief topic of discussion in local motor car circles the past wek has been the report of the tax commission appointed by Governor Osborn to make an inquiry into the tax question. The report, which was made public a few days ago, confirms earlier statements to the effect that the motor industry would come in for a good deal of consideration. That an attempt will be made by the state to force the manufacturers to pay more taxes was made clear by the governor in an address before the members of the Detroit board of commerce at a luncheon in the Hotel Cadillac last Thursday, when he said:

Governor's Argument

"There is to my mind no good reason why those corporations of Michigan which bear inadequately their burden of taxation should not be brought to a point of correction. The motor industry in Detroit and Michigan is one that should be aided and encouraged in every reasonable manner. But there is not one car manufacturer who would care to be placed in the charitable class, or who would contend that $1.40 per thousand is enough taxation, when the railroads are paying $20.55; residences in cities and villages, $14.50; farms, $10; electric railroads, power, heat, light and gas companies, $7, and manufacturing corporations, $5.30. This inequality and unfairness is intolerable. It is your duty to assist in correcting this condition in the best way possible, rather than to hamper, or harass, or confuse, or misdirect, which I do not accuse you of.

"In order to obtain the best results we must not handicap genius, industry or efficiency. Only through natural and unrestrained growth can we have the best business service. It is not restraint to expect and compel the strong to bear their honest share of the public burden or to hold them in that leash that will prevent extortionate charges for service. Already there has been too much artificial commercial stimulation in this country. It is just as harmful to be money-drunk or commercial dope fiends as it is to poison ourselves in other ways."

Figures Are Quoted

The figures quoted by the governor were taken from the tax commission's report. With reference to the motor industry in Michigan, the commission shows that manufacturers of motor cars and parts in the state reported a total net income of $14,508,529; net income, exclusive of all interest, $13,428,053; capital stock, $29,192,079; indebtedness, $47,239,044; taxes paid in 1909, $185,000. Says the report:

"The net income, exclusive of interest, capitalized at 10 per cent, gives the value of the stockholders' equities as $134,280,530, which, divided into the taxes paid for these industries, gave a rate of $1.40 on the thousand. If we add the indebtedness, the value of the corporate business is $181,000,000, which paid taxes at the rate of $1.05 per thousand, or 1.14 per cent of the net income.

"A careful perusal of the methods employed and the results produced in these figures demonstrates the existence in Michigan of a large amount of property grossly undertaxed, as compared with other property."

In another part of its report the commission says: "It will be shown that too much attention has been centered on the taxation of farm property and railroads, while the motor car manufacturing industry seems to have been sadly neglected, as viewed from a taxation standpoint."

In response to many requests from various interests, the commission has arranged for public hearings on its report. These will begin at Lansing in a day or so, and it is expected that the motor car makers will be well represented.

R. C. Hupp and his brother, L. G. Hupp, have answered the suit of the Hupp Motor Car Co., asking that the defendants be restrained from using the name Hupp in connection with their business. The answer was filed by Attorney Kirchner.

R. C. Hupp Answers

In this answer it is claimed the Hupp Motor Car Co. decided, in August of the present year, to discontinue the manufacture of the light runabout type Hupmobile and that a car of entirely different design, at a higher price, would be marketed instead. The Hupps state that, owing to this decision, R. C. Hupp concluded to withdraw entirely from the Hupp Motor Car Co., believing that he could not conscientiously adhere to the policy decided upon.

It is further averred in the answer that the directors of the Hupp Motor Car Co. declared heavy dividends over the protest of R. C. Hupp, who urged that sufficient funds be set aside for building a factory to manufacture Hupmobile parts instead of buying parts and building merely an assembled car. The Hupps claim that the Hupp Motor Car Co. was fully aware that the name Hupp would be used in designating the various companies organized by R. C. Hupp to make the Hupmobile and other parts, and that no objection was made to the use of the name Hupp until after R. C. Hupp announced his new car, the R. C. H.

The Hupps state their belief that the effort to prevent the use of the name Hupp in connection with the new car has, as its object, to lead the public to believe that R. C. Hupp is still identified with the Hupp Motor Car Co., thereby preventing him from going before the public and stating the true facts of the case.

Attention is directed to the great difference between the R. C. H. and the Hupmobile and the advertising policy in marketing the new car, as evidence that the defendants are not seeking to profit by the prestige of the Hupp Motor Car Co. and are using every effort to make it clear to the public that there is absolutely no connection between the defendants and the Hupp Motor Car Co.

Detroit Activity Continues

The activity that prevailed in Detroit factories earlier in the month continues, with no sign of abatement. Many of the plants are working both day and night shifts and still are behind orders in some instances. So there is every reason to believe that the business for the month will ment directly from the warehouse at the present time.

The Chalmers Motor Co. is planning the erection of a new warehouse at its plant in the very near future. It will be so arranged that cars can be loaded for shipment directly from the warehouse. The plant is running full capacity.

The Chalmers annual technical convention began last week, with a good attendance. The convention will be held in three divisions, the second division convening today, and the third October 30. Those in attendance last week included technical men from the eastern cities and from Michigan, Ohio and Indiana. Nearly an entire day was spent in dissembling and studying the chassis of the Chalmers 36. Talks were given by George W. Dunham, vice-president and consulting engineer of the company; A. B. Hanson and R. O. Gill, of the service division, and C. C. Cross, head of the inspection department. Particular attention was given to the Chalmers standardization methods. These conventions are for the benefit of representatives of the service divisions and of Chalmers dealers and Chalmers road men.

Visitors at Cadillac Plant

Three delegations representing outside motor car manufacturers, including managers and their engineering staffs, were among the visitors to the Cadillac plant last week. They came for the express purpose of studying the Cadillac electric starting and lighting process. The Metzger Motor Car Co. entertained a dozen or more dealers from various parts of the country and state during the week.

Two freight cars, loaded with motor cars from the Metzger factory, were destroyed by fire Saturday night while standing on a siding near the plant. The origin of the blaze is a mystery. The loss is about $7,000.

Late News from the Trade Centers

Detroit Reports Continued Activity in Erection of New Factories—Meeting of Halladay Creditors Held—Velie Branch Managers and Agents Attend Annual Convention in Moline

In addition to the condemnation proceedings instituted in the recorder's court a few days ago, the Herresshoff Motor Co., which is building a factory on Woodward avenue, in a fashionable residence neighborhood, now has an injunction suit on its hands. Judge Donovan, of the Wayne circuit court, has issued an order, on the petition of several residents of the neighborhood, directing the company to show cause why an injunction should not issue.

The 3-ton Packard truck, which was brought back to Detroit a few days ago after its transcontinental run from New York to San Francisco, leaves today on an exhibition tour that will cover a period of several weeks. It goes first to Toledo, O. Other cities to be visited are Cleveland, Rochester, Syracuse, Albany, Boston, Providence, Hartford, Bridgeport and New York. It will be driven by Arnold Haener, who, with W. T. Fishleigh and E. L. Burnett, made the transcontinental trip. The motor has not been overhauled, and the truck bears about the same appearance it did on its return from the west.

Maxwell Messenger Run

The United Motor Detroit Co. is well pleased with the showing made by the Maxwell Messenger in its 120-hour nonstop run, which ended last Tuesday. The little 16-horsepower car covered a total of 2,060 miles, consumed 91 gallons of gasoline, an average of 22½ miles per gallon; 82 pints of oil and 2 quarts of water. The only adjustment was the tightening of the high and low-speed bands. With the bonnet still sealed, the car was sent out, Wednesday morning, on a cross-state trip to Kalamazoo.

Weather permitting, the Wolverine Automobile Club will hold the second of its under-sealed-orders sociability runs next Sunday. The Detroit Saturday Night offers a silver trophy to the member coming nearest to the time of the pathfinding car. The club is making arrangements for a big social evening November 4. It is also planning to get out a club publication. The first number will make its appearance early next month.

Frank Kulick Married

Frank Kulick, who drove a mile in 50 seconds in his Ford special at the state fair grounds, last month, and was presented with a $1,000 bill by Henry Ford, has taken a bride in the person of Miss Mary Schebel, a Detroit girl. They motored to Chicago for their honeymoon.

The Mechanics Motor Car Co. has filed articles of association at Lansing. The capital stock is placed at $10,000, represented in part by plans and specifications of a motor car. Nothing has been paid in as yet. Other recent incorporations are: The Burdick Motor Transfer Co., Kalamazoo, $10,000; the K. and H. Lamp Co., Detroit, $12,000; the Lakeland Motor Works, Lakeland, $10,000, and the Northern Vehicle Co., Detroit, $10,000.

The General Motors Co. has found it necessary to seek larger quarters for its general offices and will move from its present location at 127 Woodward avenue to the new Boyer-Campbell building as soon as the latter is completed, occupying practically the whole building with the exception of the ground floor.

M. H. Snyder, of Bozeman, Mont., has been appointed sales manager for the Day Utility Car Co. Mr. Snyder has been a dealer in Bozeman for several years.

R. M. Lockwood, of New York, head of the foreign department of the Regal Motor Car Co., of Detroit, sailed from New York Saturday for a trip around the world in the interests of the company.

VELIE MEN ATTEND CONVENTION

Moline, Ill., Oct. 22—Velie branch house managers, Velie agents and Velie dealers from all parts of the United States and many foreign countries attended the first annual convention of the Velie Motor Vehicle Co., held at the Velie plant October 20 and 21. Velie representatives came to the convention from as far west as Spokane, Wash., as far east as Boston, as far south as the British West Indies and Buenos Ayres. One of the most interesting features of the convention was the meeting of the Velie representatives at the Velie plant on Friday morning. After an address of welcome given by Sales Manager George H. Lloyd, a most interesting discussion on present day motor construction was given by Chief Engineer C. B. Rose, making car comparisons with the 1912 Velie chassis as a standard. Interesting talks on Velie sales, Velie policy and Velie service were given by Sales Manager Lloyd and Assistant Sales Manager C. P. Hatter and Velie representatives from all parts of the country. All mechanical details of the 1912 Velie lines were given by Chief Engineer C. B. Rose.

Friday evening a special banquet was served at the Manufacturers' hotel. Major Lawson M. Fuller, general manager and secretary, officiated as toastmaster; the band from the Velie factory played the Velie song from a bower of roses dispersed with Velie pennants. The table was decorated with a Velie song at each plate. Short after-dinner talks were given by many of the representatives, when all packed in Velie cars attended the Velie night at the American theater, Davenport, Iowa. Upon their return to Moline a midnight Dutch lunch was served in the rathskeller of the Grey Gables. Saturday was spent in further discussions and many ideas of Velie publicity, advertising, sales and service were given. The convention closed formally Saturday night with a banquet given by the Velie company at the Commercial Club in Davenport, Iowa. Addresses were given on publicity by branch house managers, Morton H. Luce of Chicago, and Harold D. Bornstein of Boston.

SPRING-WHEELED CAR TESTED

Chicago, Oct. 26—A National car, equipped with the Leap spring wheels and solid tires, made by the Leap Resilient Wheel Co., of Chicago, reached Chicago today after a run from Detroit. It was driven by W. B. Gray and carried three passengers. It left Detroit Monday afternoon. The trip was a demonstration run from Chicago to Detroit and back to show the reliability and riding qualities of the new spring wheel as a substitute for pneumatic tires. The spring wheel is made up of a number of curved spokes of vanadium steel fastened at the inner end to the hub and at the outer end to shoes which slide along the inside of the wheel rim. When the wheel hits a bump, the spokes bend and the shoes slip on the rim so the shock is taken up in the wheel instead of being delivered to the passengers. Swinehart solid tires are used on the car.

HALLADAY CREDITORS MEET

Streator, Ill., Oct. 23—A meeting of the creditors of the Streator Motor Car Co. was held in Ottawa last Wednesday, but it simply was for the purpose of filing claims. Another meeting is to be held 10 days from tomorrow, at which time a vote will be taken as to whether or not the proposition of the company will be considered. An affirmative vote, it is claimed, will practically put the corporation out of debt and transfer the indebtedness onto the shoulders of J. Barlow and Paul R. Chubbuck, who will have from 1 to 5 years to pay under the terms of the bond.

CHICAGO HAS FALL MATCH BOOKED

Chicago, Oct. 21—The fall match for the Myers trophy between the Chicago Automobile Club and the Chicago Athletic Association having failed to materialize, the former organization has decided to hold a team match between the amateur and trade members of the club. It is to be a 2-day run to Waukesha, Wis., and return, and to take place November 9 and 10. Allen S. Ray will captain the amateurs and the trade forces will be led by Thomas J. Hay. The penalties are to be for work and time.

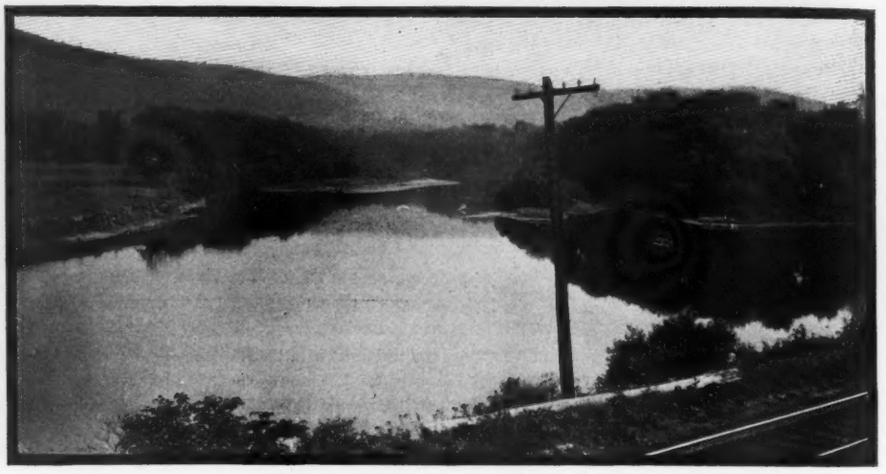
Routes and Touring

SCENERY NEAR BRADFORD

CHICAGO—Editor Motor Age—Mountain scenery, oil derricks and good roads predominate in the vicinity of Bradford, Pa., a city of oil refineries located among the foothills of the Alleghanies in northwestern Pennsylvania. The Automobile Club of Bradford has done much in the way of improving and macadamizing the roads in and around Bradford, and the accompanying photographs, taken while in this locality this summer, show two scenic views of the Alleghany river as seen from the main motor highway between Bradford and Salamanca, N. Y.

A particularly scenic trip from Bradford is over the Rock City hill, a climb of some 700 feet, is Olean, N. Y., known as the tank city. At Rock City, the summit, a beautiful panorama view is obtained of the Alleghany mountains, the Alleghany river and its valley, with Oleon in the distance. In contrast with this mountain climb is the return to Bradford through the beautiful Alleghany valley.

The hills throughout this section are dotted here and there with the towering derricks, typical of an oil country, and not infrequently may be seen others standing on the crest of a hill in bold relief against the blue of the sky.—Reader.



ALLEGHENY RIVER AND TUNA CREEK BETWEEN SALAMANCA AND BRADFORD

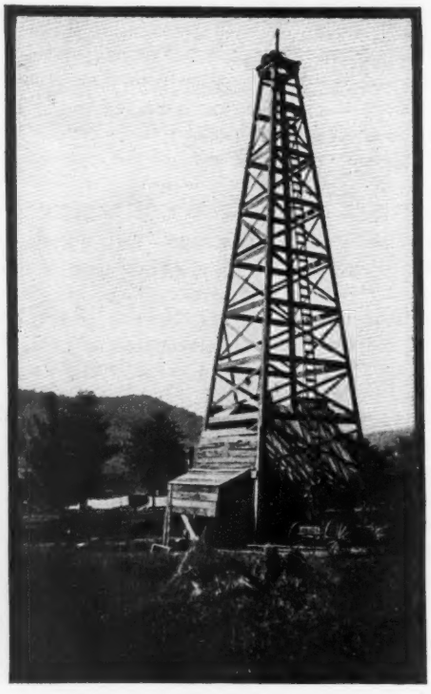
INTERESTED IN PROJECTED ROAD

Madison, S. D.—Editor Motor Age—This state is taking a good deal of interest in the proposed Meridian road from the Gulf of Mexico to Winnipeg. It is planned to enter South Dakota at Yankton, where the Missouri river will be crossed. From there the road is projected directly north, with hardly a turn, to Salem, then in a northeasterly direction to Madison. From Madison the tentative route goes almost straight north to Arlington and then nearly directly north to Watertown, where it will probably go northeast into Minnesota. Other states should take an active interest in the matter and help further the project.—H. H. Frudenfeld, Secretary Lake County Motor Club.

LONG TRIP TO ST. ANDREWS BAY

Beloit, Kan.—Editor Motor Age—I desire to start for St. Andrews Bay, Fla., from Beloit, Kan., and will appreciate it very much if Motor Age will give me the best course to take. I am more or less familiar with the roads of Missouri and Arkansas and am inclined to think I do not want to attempt them at this time, and I will not be adverse to being routed over the Overland trail from Minden to Omaha, thence east perhaps to Wheeling, W. Va., and Baltimore, where I understand one can find what I remember to be called the National highway, south into Florida. St. Andrews Bay is 50 or 60 miles east of Pensacola. One can probably run from Atlanta, Ga., and thence from there south.

The desired route over the Overland trail from Minden to Omaha passes through Heartwell, Juniata, Hastings, Flickville, Harvard, Saronville, Sutton, Grafton, Fairmont, Exeter, Friend, Dorchester, Milford, Lincoln, Havelock, Waverly, Greenwood, Ashland, and Millard. Cross the Missouri river to Council Bluffs and continue on the river-to-river road as far as Davenport through Weston, Underwood, Avoca, Walnut, Marne, Exira, North Branch, Guthrie Center, Monteith, Dale, Redfield, Adel, Ortonville, Des Moines, Altoona, Mitchellville, Colfax, Newton, Kellogg, Grinnell, Brooklyn, Victor, Ladora, Marengo, Homestead, Oxford, Tiffin, Coralville, Iowa City, West Liberty, Atalissa, Moscow, Wilton Junction, Durant, and Davenport.



PENNSYLVANIA LANDMARK

An oil derrick typical of the Allegheny oil regions

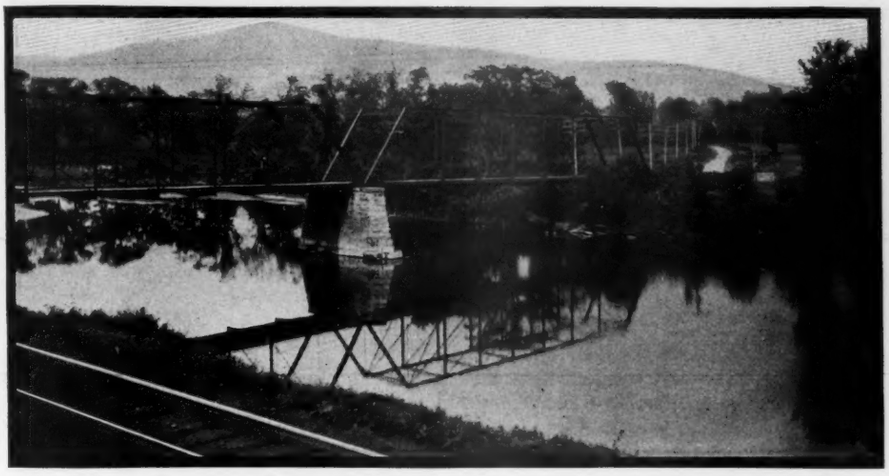
From Davenport to Chicago is through Pleasant Valley, Le Clair, Princeton, LaFolett, Camanche, Clinton, Fulton, Morrison, Sterling, Dixon, Ashton, Rochelle, Creston, DeKalb, Geneva, and Lombard, a distance of 286 miles. The Chicago-Indianapolis leg is through South Chicago, Hammond, Dyer, St. John, Crown Point, Orchard Grove, Shelby, Thayer, Virgie, Rensselaer, Remington, Wolcott, Montmorenci, Lafayette, Mulberry, Jefferson, Frankford, Cyclone, Kirklin, Rosston, and Augusta, a distance of 204.8 miles.

The most direct route lies through Louisville, Ky., Nashville, Tenn., Birmingham and Montgomery, Ala., but it is probably the better route over the National highway from Hagerstown, Md., to Roanoke, Va., Charlotte, N. C., Atlanta and Birmingham. Over this old national pike from Indianapolis the routing takes you through Cumberland, Greenfield, Ogden, Dublin, Cambridge City, Centerville, Richmond, Eaton, New Lebanon, Dayton, Harshman, Fairfield, Enon, and Springfield, where you will find mostly excellent gravel pike roads following through Harmony, Vienna, Brighton, Somerford, Lafayette, West Jefferson, Alton, and Columbus.

There is a route from Columbus to Zanesville which is 5 miles longer than on the highway and over fine macadam, good dirt and gravel roads via Newark through Granville, Newark, Hanover, Nashport, and Irville; at Zanesville continue on the highway passing through Bridgeville, Norwich, New Concord, Cambridge, Washington, Elizabethtown, Fairview, Hendrysburg, Morristown, Lloydsville, St. Clairsville, Bridgeport, Wheeling, West Alexander, Claysville, and Washington.

Between Cambridge and Wheeling there is a toll road most of the way; beyond that point you will encounter a hill road

Information



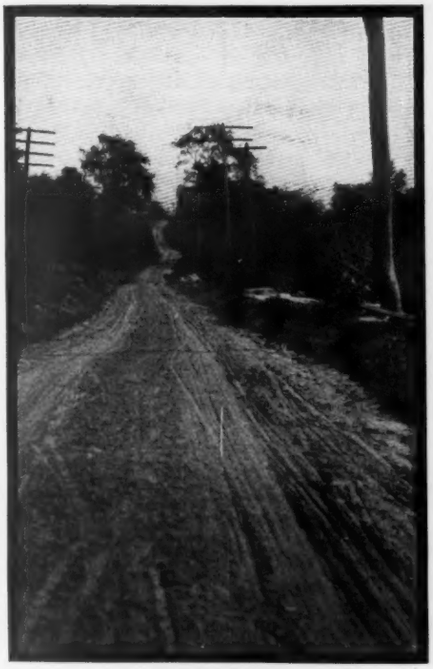
BRIDGE ACROSS ALLEGHENY RIVER BETWEEN SALAMANCA AND BRADFORD

with many turns, patches of macadam; but most of the way either fair country road or worn pike. This is not a good road for rainy weather, but good time can usually be made in settled weather. From Washington traveling towards the coast go through Beallsville, Brownsville, Uniontown, Somerfield, Petersburg, Keyser's Ridge, Grantsville, Frostburg, Eckhart, Cumberland, Flint Stone, Hancock, Clear Spring, Hagerstown.

The New York-Atlanta highway is traversed now through Tilghmantown, Battlefield of Antietam, Sharpsburg, Shepherdstown, Halltown, Charlestown, Clifford, and Berryville. A more direct route from Hagerstown lies through Williamsport, Martinsville, Clarksville, Bunker Hill, Ridgeway, Clear Brook, and Winchester. Continue south through Stephen City, Middletown, Strassburg, Maurertown, Woodstock, Edinburg, Mount Jackson, New Market, Lacey Springs, Harrisonburg, Mount Crawford, Burkstown, Verona, Staunton, Minte Springs, Breenville, Midway, Fairfield, Lexington, Fancy Hill, Natural Bridge, Buchanan, Troutville, Cloverdale, Roanoke.

The road between Martinsville and Roanoke is a rough, mountainous one. In fact, continuous stretches of first-class roads in the South are very scarce. Anyone contemplating a trip over southern roads should be well provided with block and tackle, and it would be well to have a car with a 60-inch tread. There are many toll-gates on this route and at each a toll of 15 cents is charged. The Blue Book states that it is necessary to register name, residence and license number with each gate keeper.

From Roanoke to Winston-Salem you pass through Rocky Mount, Syndorville, Oak Level, Martinsville, Ridgeway, Stoneville, Madison, Ellisboro, Stokesboro, Kernersville, and Centerville. You will have to



SEEN IN PENNSYLVANIA

Hill road traversed between Bradford, Rock City and Oleon

ford many small streams, the first part being very hilly, with deep grades. The itinerary from Winston-Salem to Atlanta is as follows: Summerfield, Guilford Battle grounds, Greensboro, Jamestown, High Point, Thomasville, Lexington, Spencer, Salisbury, China Grove, Kanapolis, Concord, Newell, Charlotte, Sloane's Ferry, Belmont, Lowell, Gastonia, Bessemer City, King's Mountain, Grover, N. C., Blacksburg, S. C., Gafney, Converse, Spartanburg, Duncan, Greer, Greenville, Oak Grove, Piedmont, Anderson, Lavonia, Canon, Royston, Franklin, Commerce, Winder, Auburn, Lawrenceville, Snellville, Stone Mountain, Scottdale, Ingleside, and Decatur.

Atlanta to Montgomery lies through East College Point, Palmetto, McCollon, Newman, Moreland, St. Charles, Grantville, Hogansville, La Grange, Langdale, Glass, Beulah, Opelika, Auburn, Tuskegee, and Mount Meigs. There is 125 miles between Montgomery and Florala through Snowdown, Ramer, Doubling, Orion, Troy, Springfield, Elba, Opp, and Greenbay. In case you desire any information we are advised that W. D. Patrick, of Montgomery, Ala., who is an enthusiastic member of the Alabama Automobile Association, will furnish any advice possible.

The best route from Florala to the gulf will be to De Funiak, 26 miles; Chipley via Ponce de Leon, Westville, and Bonify, 32 miles; Vernon, 16 miles, and St. Andrews Bay 62 miles. You probably will be able to secure beneficial information at De Funiak from the M. and B. Auto Co.

ASKS ABOUT THE BLUE BOOK

Prairie du Sac, Wis.—Editor Motor Age—Will Motor Age kindly give the best route from Madison, Wis., to Cincinnati, O., by way of Moline, Ill., and Indianapolis? Will volume 4 of the Blue Book take in the territory covered on this tour? —L. Tarnutzer.

Yes, this entire trip is covered by the Blue Book in volume 4. Follow route No. 131 to Rockford, Ill., a distance of 75.1 miles, through McFarland, Stoughton, Edgerton, Indian Ford, Janesville, Beloit and Roscoe; Rockford to Dixon, route No. 93, takes you through Byron and Oregon; and Dixon to Moline is outlined in routes No. 25 and 27 through Sterling, Galt, Lydon, Denrock station, Erie, Hillsdale, Watertown, E. Moline and Moline. Motor to Davenport and follow route 524 to Galesburg through Rock Island, Milan, Swadonia, New Windsor, Alpha and Henderson. Now headed for Champaign, routing Nos. 73, 63 and 55 will take you to Knoxville, Maquon, Middle Grove, Farmington, Trivoli, Hanna, Peoria, Groveland, Tremont, Mackinaw, Lily, Danvers, Bloomington, Downs, LeRoy, Farmer City, Mansfield and Mohomet. A choice of two roads is offered to Indianapolis, route 87 or 87A, the latter being the shortest and through Urbana, Homer Catlin, Danville, Covington, Veedersburg, Hillsboro, Waynetown, Crawfordsville, Whitesville, New Ross, Jamestown, Pizton, Pittsboro, Brownsburg and Clermont. Traveling over fine gravel and macadam road to Cincinnati No. 231 routes you through New Palestine, Carrollton, Fountaintown, Morristown, Arlington, Rushville, Farmington, Connersville, Evarts, Blooming Grove, Brookville, Cedar Grove, New Trenton, Harrison, Miamitown, Dent and Cheviot.

SUGGESTS A BETTER ROAD

Wichita Falls, Tex.—Editor Motor Age—I am a regular reader of Motor Age, also owner and driver of a motor car which I use considerably in my business in cross-country drives, and am also interested in

ROAD NEAR GARDEN CITY, KAN., TRAVELED BY MOTORISTS HEADED FOR DENVER

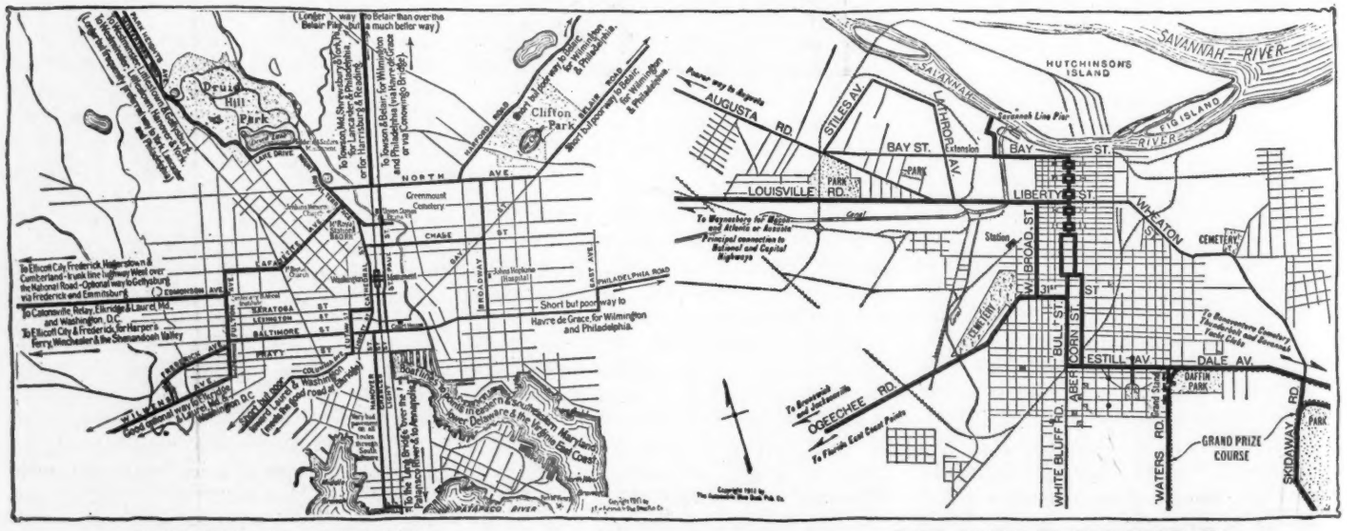
touring routes. I note in the issue of September 28, in a route from Toledo to Brownsville, going through Oklahoma City to Fort Worth, a crossing Red river between Terral and Ringold is suggested which would take a tourist through a number of miles of awful sand between Bowie and Decatur. I appreciate the fact that in doing this the old Glidden tour was outlined through that section, but the truth is the Glidden tourists could have profitably avoided that very bad route. Cars frequently make the trip from here to Fort Worth and Dallas, but as far as I have been able to learn no motorist has ever been willing to tackle the continuous sand-bed between Bowie and Decatur a second time. All who have experienced that now prefer to go from here via Jacksboro and Weatherford into Fort Worth.

I would recommend to all tourists from the north or east who are bound for Fort Worth or Dallas, or even central and south Texas, and who come as near here as Enid, Oklahoma City or El Reno, that they route via Lawton, Randlett, wagon bridge on Red river near Burkburnett, Burkburnett, Wichita Falls, Jacksboro, Weatherford and Fort Worth. The toll bridge across Red river at Burkburnett is 900 yards long, was completed about 1 year ago, and the owners of it have up to this date kept the road through the river bottom, a distance of about 1 mile, covered with straw, which makes it possible for cars to travel through the bottom on high gear. I understand that this is the only bridge across Red river this side of Paris, Tex., which is available to motor cars. The road from Lawton to Wichita Falls, a distance of 63.2 miles, is excellent, and for several miles out of here on the way to Jacksboro it is first class. Around Jacksboro there are some poor stretches, although nothing near as bad as between Bowie and Decatur. A few miles this side of Weatherford on into Fort Worth it is excellent.

On July 22, W. A. Reid and myself, each accompanied by a friend, started out in our Cadillac cars on a tour through Oklahoma and Kansas into Denver, Colo., and from Denver back home via Ratoon, N. Mex., Amarillo and Quanah. Our party would not hesitate to recommend to all tourists in Texas east of Wichita Falls and north of Waco who contemplate a trip to Colorado Springs or Denver that they go via Lawton, El Reno, Enid and on to Dodge City, where they strike the Santa Fe trail in preference to Vernon, Quanah, Childress, Estelline and Memphis, Tex. Much of the road between Vernon and Clarendon is frightful and the accommodations of every character are far superior on the Oklahoma and Kansas route. The latter route is longer, but each member of our party would take it in the future in preference to the other route. In going through Oklahoma and Kansas we went off the above route some, lengthening our trip considerably, but did so because of our desire to visit Oklahoma City and Wichita, Kan. Our direct route would have been from El Reno to Enid and from there to Dodge City.

We followed the Motor Age routing from Lawton via Oklahoma City, Wichita, Hutchinson and on into Denver. After spending several days around Colorado Springs and Denver we reached home on the night of August 14. My car covered on this tour a distance of 2,361.2 miles entirely on its own power, without the aid of a horse, mule or any kind of outside help, although it was very bad going be-

A FAMILIAR LANDMARK
One of the many monuments which mark the old winding trail of the pioneers



BALTIMORE, MD., CITY MAP

BEST ROADS IN SAVANNAH, GA.

Copyrighted Automobile Blue Book Publishing Co.

tween Pueblo and Walsenberg and between Clarendon and Vernon. I started with casings that had covered 1,750 miles and had not one blowout and only two punctures on the entire trip. The only repairs necessary to my car on the entire trip were as follows: Burned clutch leathers, adjustment of carbureter, tightening of windshield, replacing loose vibrator button, and renewing link to cutout spring. The casings mentioned have not been off any of my wheels since that trip, have now covered a total of 4,560 miles and appear to still be in good condition. Our trip from Randlett to El Reno was through mud all the way, following heavy rains the previous day, and we had heavy rains again in Kansas, with mud from Hutchinson to Dodge City, and again in rain and mud from Pueblo to Trinidad.

By routing through El Reno, Wichita Falls, Jacksboro and Weatherford to Fort Worth, there are not only good roads the greater part of the way but better bridge crossings over the South Canadian river near El Reno and the Red river near Wichita Falls, and the awful stretch of sand between Bowie and Decatur is avoided.—D. P. Talley.

TOURING OKLAHOMA

Oklahoma City, Okla.—Safe at home from a run of more than 1,500 miles, we traveled over all kind of roads, with seven tire mishaps 1 day and the other 13 days of the run made with the smoothness that characterizes a successful motoring trip. I drove my Buick and my partner his Flanders, and each of us was accompanied by our families.

On the way west, in the early part of the trip, the small run of 62 miles was made in 1 day. That day was featured by tire mishaps, more time being spent in tire repairing than in operating the cars.

Nearing Pueblo, we overtook a banker from Coffeeville, Kan., who had trouble with his chain, and was helpless so far as repairs were concerned. My partner and I repaired the broken chain, and the rescued party joyfully proceeded to the Colorado capital.

The route from Oklahoma City to Denver follows the old Santa Fe trail, after

DAWSON PARTY NEAR PUEBLO, COLO., STOPPING TO ASSIST AN UNFORTUNATE

reaching Kansas. The main trail runs from Atchison to Santa Fe, with a branch to Denver. This branch, tramped over by the pathfinders half a century ago, now is the main motor car roadway from Kansas and Oklahoma to the Rocky mountains.

The roads encountered on the trip over the ground which had been tramped by countless herds of buffalo many years before motor cars had become a part of American every-day life, were dry and as a rule smooth. The average speed maintained was 10 miles an hour, the trip being simply a vacation for the purpose of getting away from adding machines, tickers and typewriters.

During 14 days running it only rained 4 minutes and that occurred while a tire was being repaired.—Kaye W. Dawson.

PROJECTED TOUR TO DALLAS, S. D.

Sargent, Neb.—Editor Motor Age—In the Routes and Touring department will Motor Age please give the most practical motor car route from Sargent, Neb., to Dallas, S. D., taking into consideration the sand trip. Also give a routing from Sargent to Glen Elder.—W. T. Cooper.

Motor Age is advised that the most direct route to Dallas, S. D., is through Ord, Sumter, Parnell, Belfast; southeast to Greely Center, east to Cedar Rapids, east and north to Albion, Oakdale, Brunswick, Creighton, north and west to Verdigris, north to Niobrara, west and north to Butte, Bonesteel, west to St. Charles and northwest to Herrick, Burke, Gregory and Dallas.

There is another route via Atkinson. Sargent to Taylor 16 miles, to Burwell 15 miles, to Devier store 12 miles, to Ballah P. O. 15 miles, to Amelia 13 miles, and to Atkinson 25 miles. While this is not what one would call a motor car road, yet it can be traveled without much trouble. There is 6 miles of sand hills north of Devier store and the balance of the road is fairly good. At Atkinson continue to O'Neill, Inman, Ewing, Clearwater and Neligh and the balance as outlined in the first paragraph.

As near as Motor Age can find out, the roads from Sargent to Minden are all in fair shape. The itinerary is as follows: Sargent to Arcadia, 20 miles; Arcadia to McAlpine, 5 miles; McAlpine to Loup, 5 miles; Loup to Austin, 4 miles; Austin to Rockville, 6 miles; Rockville to Ravenna, 8 miles; Ravenna to Prairie Center, 15 miles; Prairie Center to Kearney, 12 miles; Kearney to Minden, 15 miles. The road from Kearney to Minden is very fine. There is a well-kept dirt road without grades the balance of the way to Glen Elder through Franklin, Riemsville, Smith Center, Portis and Downs. This run can be made in a day.

Latest Bulletins on Roads from Touring Club of America

Editor's Note—At the present time scouts representing the Touring Club of America are engaged in studying road conditions in various parts of the country. Herewith are reports made by them as to the condition of the highways in New York, which undoubtedly will prove interesting to tourists who are taking advantage of Fall weather.

UTICA SECTION

UTICA to Rome, road is all macadam with exception of short stretch, Utica to Deerfield. County roads not traveled much are in fine condition all through this part of the state.

Elizabethtown to Westport: Excellent toll road; toll 15 cents. Elizabethtown to Lake George: Elizabethtown to Underwood passable, but under state road construction, 50 per cent completed. Underwood to Schroon Lake: Fair dirt road, Schroon Lake to Chestertown state road. Chestertown to Lake George, good dirt road.

NEW YORK SECTION

The road from Watertown through to the Adirondacks is being greatly improved all along the line, there being at least a dozen stone crushers at work, between Gouverneur and Paul Smith's. This does not interfere with travel and no detours are necessary.

The road from Gouverneur into the Adirondacks through Oswegatchie Pierce field and Tupper Lake into Saranac is not as bad as one would expect to find in the wilderness. The road for the most part is sandy and narrow, there being 6 miles from McAlese's that goes through the forest and is adirondack mud. A preferable way of getting here is to go to Potsdam and from there down, making connection with this road. This also makes a connection into Cranberry lake and Wabeck.

From Saranac to Malone the road is in very good condition. The sandy, narrow stretch beyond Paul Smith's has been widened out and a good stone road is being built the entire distance.

From Malone to Potsdam the best way is straight out on macadam in Moire, turning left on road across to the old turnpike, about 3 miles outside of Nickelville, where connection is made with the present Blue Book route. An option from Hickington into Potsdam is through Parishville, some 2½ miles farther, but the road is very little better, and Potsdam motorists use the direct line.

From Potsdam to Antwerp the road is in very good condition all the way through. Those not desiring to go into Watertown may keep straight ahead on the outskirts of Antwerp and go direct to Carthage, where connection is made with Blue Book route to Utica, via Rome—or, by turning right from Carthage, an all macadam road is taken direct into Watertown—some use this line in going from Watertown east, instead of going via Adams Mills, on account of the clay near Philadelphia.

From Watertown to Oswego follow the Blue Book route, but instead of turning right into Lacona keep straight ahead on a fairly good dirt road to Richland; turn right on macadam into Pulaski where connection is made for Syracuse and Oswego.

COST OF SPARE PARTS

Objects to Price of Repair Parts From Factory

PAUL SMITHS, N. Y.—Editor Motor Age—The views of Owner in the issue of September 14 Motor Age, in the Readers' Clearing-House columns, in regard to service departments are theoretically correct. There is no doub' that a factory has every advantage in overhauling a car, but my own experience with factory overhauling has been a very poor job, and an enormously big bill. This work was done at a factory that has always boasted of its service department. Since this sad experience I always have overhauled at a machine shop—not a garage—and though they are not always experts at tuning up a car, yet one gets his money's worth of repairs, and the final adjustments can be made by the owner or by any competent chauffeur.

The main kick that I have against factories in general is the exhorbitant prices charged for spare parts. I regret that I have no catalogs on hand so as to better emphasize my remarks. However, I remember adding up the cost of the spare parts for a car that cost $3,500. The total for spare parts to make this car was over $17,000. A careful review of this subject undoubtedly would be of interest to Motor Age readers and might make some of the manufacturers see that it is a poor business policy to charge so much for spare parts that it makes the up-keep of a car seem far larger than it ought to be. A machine shop without jigs usually will produce a part cheaper than it can be obtained from the factory. How many factory buyers would retain their jobs if they paid even 3 cents apiece for clutch disks? Yet we pay from 25 to 50 cents when we need a new one for our cars. Many an owner will squeeze along, complaining that his car is not right, because that car needs some small spare part. If the manufacturer would sell this part at a fair figure the owner undoubtedly would have had it fixed, and would be a better satisfied customer. I understood that one maker of low-priced cars makes the price of his car and the total of his spare parts the same. This ought to give him a fair profit and many satisfied customers. I trust that we may have a more comprehensive review of this subject before long, and that it may cause a reform by some of the manufacturers who now pursue the hold-up policy.

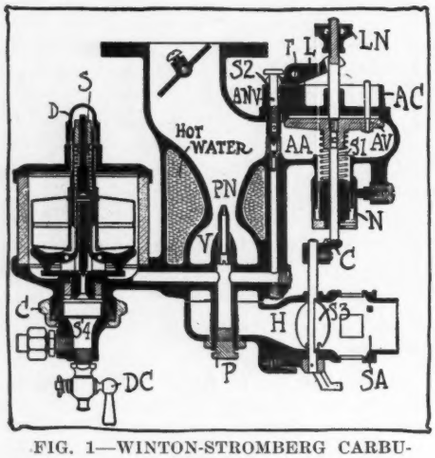


FIG. 1—WINTON-STROMBERG CARBURETER

As a finale to this grumble let me add one good word and that is for Motor Age. Motor Age does not seem afraid to call a spade a spade, or rather a car by its right name. This is the policy of the leading English motor papers, and I like it. To conceal the name of a car about which the correspondent complains of a "knock in the front cylinder" may not help to keep an advertiser; but what earthly good is the reply of the technical experts if we, the readers, do not know to what kind of a car the remedy applies. Besides, it ought not to hurt the reputation of a car just because an occasional driver has an occasional trouble with his engine.—George H. Townsend, Jr.

DESIGNER OF CASE MOTOR

Churchs Ferry, N. D.—Editor Motor Age—Will Motor Age through the Readers' Clearing House answer the following?

1—What make of engine does the J. I. Case company use in its cars?

2—Does the Pierce-Arrow use the same make of engine as the Case?

3—The Case company calls it the car with "the famous engine." Why, when and where did this engine become famous?

4—Who was the original designer and builder of the Case car engine and how many years has it been built and used?—A Reader.

1—The motor of the Case car is made at the Racine works of the J. I. Case Threshing Machine Co. The engine factory is known as the Pierce Motor Co., a part of the J. I. Case organization.

2—No.

3—The car originally was known as the Pierce-Racine.

4—The designer and builder of the motor is A. J. Pierce, who has been building motors and cars for over 10 years. Some of the cars built by Pierce in 1901 are said to be still in service.

WINTON-STROMBERG CARBURETER

In answer to an inquiry in the October 5 issue of Motor Age, page 25, relative to the adjustment of the Stromberg carbureter used on the Winton motors, the adjustment of a type B Stromberg carbureter was described and illustrated instead of a type C. In order to correct this error the following descripiton of the type C carbureter is given.

The type C carbureter is equipped with two separate gasoline spray nozzles, as illustrated in Fig. 1. The first or primary nozzle PN is mounted in the center of the carbureter with its point 3-16-inch above the normal gasoline level and surrounded by the modified venturi tube V, this nozzle being proportionate in size to the carbureter and supplying sufficient gasoline for all speeds up to 20 or 25 miles per hour. The second or auxiliary nozzle is mounted just beneath the secondary gasoline needle valve ANV in the auxiliary air passage AA. The auxiliary needle is raised by a lever L operating over a fulcrum F by the opening of the auxiliary valve AV.

After the carbureter is installed and the gasoline turned on, the level of the gasoline in the float chamber should be about 1 inch from the lower edge of the glass. This level is adjusted at the factory and should be right. In case it is obviously wrong, remove the dust cap D and turn the adjusting screw S until the proper level is obtained. If the gasoline is too high, screw the nut down; if too low, screw the nut up. Don't change unless absolutely necessary.

If it is found that the gasoline does not flow into the chamber fast enough to maintain the proper level, the gasoline line should be carefully examined to see that the pipe or the strainer S4 is not stopped up. The strainer S4 is readily accessible by loosening the coupling nut C. One should open the drain cock DC frequently, to remove the accumulation of water or sediment.

To adjust for low speed, turn up the lower adjusting nut N located underneath the auxiliary air valve so that the valve is brought up to its seat, then give two full turns to the right for pressure. This valve should not operate when the motor is running idle. All air should then be supplied through the hot air horn H. The spring S1 is the low speed spring and does the work up to about 600 revolutions per minute, when, if the throttle is further opened the auxiliary air valve begins to lift the auxiliary needle ANV.

The high speed is regulated by the lock nut LN on top of the auxiliary air valve. As it is raised or lowered it determines the point at which the auxiliary needle valve ANV will be brought into play. The auxiliary needle valve is seated by the high speed spring S2. The lock nut LN

The Readers'

EDITOR'S NOTE—To the Readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department. It has been discovered that the proper signature has not been given on many communications, and Motor Age will not publish such communications, and will take steps to hunt down the offenders of this rule if it is violated

Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired

should be about 3-32 inch above the lever L for normal adjustment, but this distance can be increased or decreased to suit the motor.

To adjust the carbureter start the motor, turn the low speed nut N up or down until the motor idles properly, then advance the spark, open the throttle and if the motor backfires, turn nut LN down until it ceases. If mixture is too rich, turn it up. Be sure that nut LN and lever L have some clearance on low speed.

To start the motor when cold close shutter S3 in hot air horn. This puts a high vacuum on the carbureter and should start the motor on the second or third turn; if not, open the valve, when it should start on the next turn. Great care should be taken to see that this valve is instantly opened after the motor starts and is kept open. The shutter SA should be open in summer and closed in winter. To drain the waterjacket, if car is stored in winter, be sure to drain the waterjacket by removing the plug at the bottom thereof.

Different sized nozzles are provided for further adjustment. If the mixture is too rich on low speed after adjustments are made according to instructions, take out the plug P and remove the nozzle PN with a screw driver, and insert a smaller nozzle. If the mixture is too lean on low speed a larger nozzle should be inserted. If the engine misses on low speed it may be caused by an air leak, and all the joints between the carbureter and the motor should be examined before a larger nozzle is inserted. If the motor backfires on high speed or if it knocks on a load when throttle is open, and when adjusted according to instructions, or if power is lacking, take off the auxiliary air valve cover AC by removing four screws, and with it you will remove the needle valve ANV. You can then remove the auxiliary nozzle AN with a small wrench. Use a larger nozzle. To ascertain that the auxiliary gasoline nozzle is clear and working properly screw up nut LN until it is ¼ inch away from the lever L, then speed up motor to 800 or 1,000 revolutions and notice the action of it. After having run the motor at this speed about a minute, press down the lever L by hand and notice if this improves the action of the motor. If so, it is evident that the auxiliary supply is clear.

Proportionate nozzle sizes for type C carbureters should be about as follows, although these sizes may be changed:

	Primary	Auxiliary
No. 2 or 1¼-inch	60	61
No. 3 or 1½-inch	59	60
No. 4 or 1¾-inch	57	59
No. 5 or 2-inch	55	58

NOT WORTH THE TROUBLE

Caborgo, New South Wales—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions?

1—In a 10-horsepower runabout the engine is a two-cylinder, horizontal opposed, with a Bosch two-cylinder magneto running at half the crankshaft speed. Could not a single cylinder magneto be used equally well, running at crankshaft speed? Would this be too rapid a rate of revolutions for the armature?

2—Whatever magneto be used, could not two spark plugs be used in series in each cylinder, namely, one ordinary plug and one double-pole plug, so as to have two simultaneous sparks in each cylinder? Would this be too much for the magneto, to have to break down two resistances at once? I may mention that two plugs can easily be fitted in each cylinder—Discuss.

1—The single-cylinder magneto could be used on the two-cylinder opposed motor by providing a distributor designed to run at camshaft speed with the magneto running at crankshaft speed, as employed in some motor cycle motors. If the magneto is in good condition, the increased speed will not injure it.

2—There are several ignition systems in which two sparks are given simultaneously in each cylinder, but a special plug and special wiring are always employed. It would be impossible to connect the two plugs in series unless one of them were insulated from the cylinder casting, an arrangement that would offer some difficulties. If the two were connected in parallel by continuing the magneto lead to the second plug from the terminal of the first, a spark would occur only at the plug offering the least resistance.

VALVE DIAMETERS OF NINE CARS

Elmhurst, Ill.—Editor Motor Age—Kindly publish the valve dimensions of the following cars: Everitt 4-36, Chalmers 30, Everitt 30, Reo 30, Abbott-Detroit 30, Warren-Detroit 30, Overland 30, Ford 22, and E-M-F 30.—Henry F. Langhorst.

The valve dimensions of these cars are as follows, the inlet and exhaust valves being the same: Chalmers 30, 2¼ inches; Everitt 30, 1 5/8 inches; Everitt 36, 1 5/8 inches; Reo 30, 1⅞ inches; Abbott-Detroit, 2⅛ inches; Warren-Detroit, 1½ inches; Overland 30, 1⅜ inches inside and 1⅝ inches outside; Ford, 1⅜ inches; E-M-F, 1¼ inches.

NEGLECT SHORTENS LIFE

Reader Points Out Reasons for Good Cars Being Junked

Sauk Center, Minn.—Editor Motor Age—Not long ago I was called upon to find out why a car was not doing its work as usual. I went to the place where the machine was stalled and found the car almost wanting in power. I began an investigation and upon questioning the owner found he had given it about a pint of oil for cylinder use, it having both force feed and splash system, for 300 miles of work. Throwing off the switch and pressing down the starting crank, the pistons were so badly corroded by allowing them to get dry and hot that the crank would stop and stay just where you pushed it to and no farther. It had no springy feel to it and it was with difficulty I turned it over enough to start the motor, but at last succeeded. I got in, took the wheel and started the car on low, and such a grinding noise you never heard in a motor car. This caused me to immediately stop and ask the owner if he had filled the transmission with grease, and when. He said

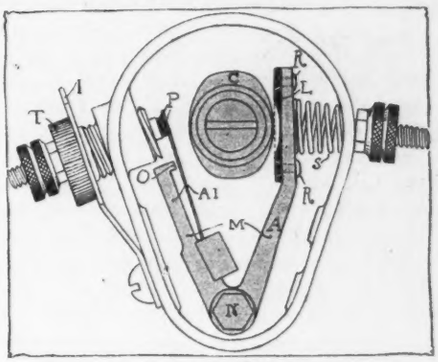


FIG. 2—REMY CIRCUIT-BREAKER

he did not know it needed grease, and had looked it over to find a place to oil and not finding it had concluded it was self-lubricating, and had paid no further attention to the matter, but had noticed the grinding noise which was apparent when the car was running.

I took my car and went home and got my transmission grease, a gallon of cylinder oil and some flake graphite, and returned to the car. I turned over the transmission until the brass stop screw came up, unscrewed it and found the gears in a very bad state for want of lubricant. I took my grease gun and forced the planetary type transmission full of grease and replaced the screws. I opened the bevel gearcase and the same as I found in the transmission was found there—no lubricant—and I gave it all it would hold. I then went at the bearings and found one front wheel with no oil or grease in the bearings and with one ball broken and cutting the race. I replaced the broken ball, filled with grease, adjusted the bearings and returned the hub cap. I then went at the engine again and opened the priming cups and filled the cylinders with kerosene, mixed with a little turpentine;

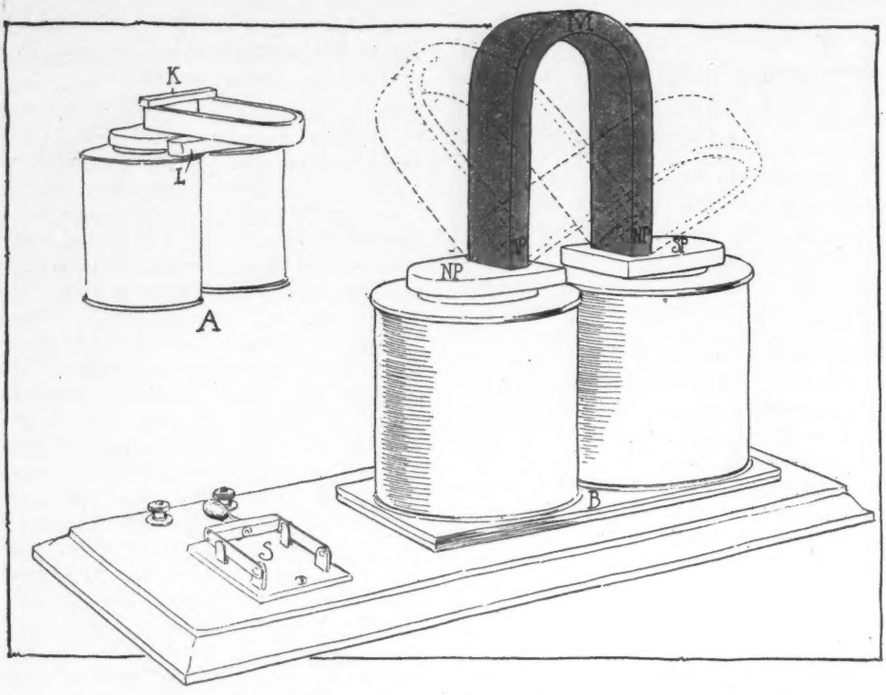


FIG. 3—MEANS AND METHOD OF REMAGNETIZING MAGNETO MAGNETS

closed the cocks and turned the engine over many times and let it stand while I filled the grease cups on all other bearings, first injecting a little kerosene to cut the gum that might be in them. I looked over the coil and ignition system and found it in good order, with the one exception of one vibrator which did not give the required fat spark, which soon was adjusted. Said the owner, who had been an interested spectator of all my proceedings:

"Do you ever, for a moment, expect to start that engine after flooding it with all that dope you have been putting in?" I assured him I really did expect to start it and make it hum, too. The cylinders now were already showing the treatment had had its effect, and the dried-up condition as found was fast giving way to the effect of the kerosene and turpentine. I poured about a quart of good cylinder oil in the breather, closed the switch and turned the engine over the center, but it did not start. This I expected. I turned it over again and away it went. I advanced the spark, opened the throttle and such a cloud of smoke as went out of that exhaust, black as coal-tar! The cutout was now brought into use and the firing of the cylinders pronounced satisfactory. We now got into the car and I opened up on a fairly good road, which it took at 20 miles per hour easily. The hills that before could not be climbed except on low gear were literally eaten up on high, and the grinding noise was gone entirely.

I gave Mr. Owner a lecture on keeping gears and cylinders in condition, and he never forgets the lesson he learned in driving a motor car. The idea of trying to run a car the distance spoken of on a pint of oil and no grease shows how many really good cars are junked when they should be doing good work upon the road. —A. D. Carpenter.

REMAGNETIZING MAGNETOS

Ordway, Colo.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions?

1—I have a two-cylinder truck equipped with Remy ignition. The engine runs all right on the magneto when it is speeded up, but misses when running slowly. It runs well at any speed on batteries. The carbureter is in good working order. Does Motor Age think the magneto is weak? If so, how can I best determine whether it needs recharging or not?

2—Kindly explain in full how a magneto can be recharged.—John N. Hanna.

1—There are two probable causes for the Remy magneto missing on low speed; one of these is improper adjustment or wear of the circuit-breaker and the other is weak magnets. See that the plate L Fig. 2 is not worn and the milled nut E is correctly adjusted. This may be determined by inspection. When the circuit breaker is properly adjusted and the cam C in the position indicated in the illustration, there should be 1/32 of an inch space at the point O; and when the widest diameter of the cam is horizontal, the points P should be separated 1/32 of an inch.

The circuit breaker, as illustrated, consists of a V-shaped piece of metal M, between the arms of which turns the cam C on the end of the armature-shaft. This cam is elliptical in shape and the wider extremities strike against one of the arms A of the V, throwing it sideways, thereby breaking contact between the points P on the opposite arm A1, and the threaded screw passing through the metal box. Where the armature cam strikes upon the arm A is fixed a metal plate L. When this becomes worn, the points P on the other side, owing to the depression from wear, will not be opened sufficiently, causing the engine to misfire at low speed.

This, generally, can be remedied by pressing in and releasing the clip I and screwing the adjusting screw T outward. If the wear of the plate is too great to be so corrected a new plate must be fitted. The V-shaped part of the magneto may be taken off by removing the nut or stud N; and the plate L then can be readily removed by cutting off the heads of the two copper rivets R with which it is secured to the arm. A new plate and rivets, or new platinum points may be obtained from the factory or a local agent at a reasonable cost.

2—The repairing of the magneto should be done only by an expert and it is advisable to send the instrument to the nearest branch for repairs. The agent for Remy magnetos in your locality is the Auto Equipment Co., Denver. Remagnetization of the magnets should not be attempted unless you are equipped for it and understand the process. Devices for the purpose can be obtained of most electrical supply houses. Two types of these are illustrated in Figs. 3 and 4.

In construction they are practically the same; both consist of two coils of wire around cores of soft iron, the two cores being joined at the bottom by a plate of the same material to form a continuous electromagnet. The coils are wound in opposite directions and the lower ends connected. The upper ends of the coils of wire are connected to a source of direct current, usually the lighting circuit. The cores may be square or round and when round are usually about 2 inches in diameter. The wire, of course, must be insulated, but the amount and size of the wire for the coils will depend upon the length and amount of iron in the core and the voltage upon which the charging device is to be operated. Several hundred turns of No. 18 wire is generally employed for 110-volt circuits.

The one shown in Fig. 4 differs from the other only in that the coil is extended above the end of the core so that the ends of the magneto magnets set down into it for a distance of about 2 inches and the coil has a copper cap C. In the other type the core extends above the coil and the magnet is set on it, as indicated in Fig. 3.

The method used differs somewhat, but the first step is the same and is of utmost importance. That is to be sure that the north pole of the magnet is set on the south pole of the core and the south pole of the magnet on the north pole of the core. If these conditions are reversed, the magnetism in the magnet will oppose that of the core and the time required to re-

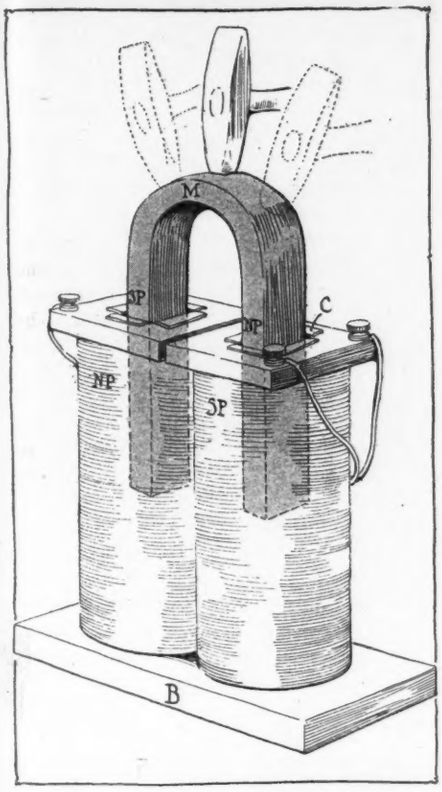


FIG. 4—ANOTHER SIMPLE METHOD

charge it will be very much lengthened.

If a magnet to be remagnetized were to be placed on an electro-magnet with like poles in contact, the polarity of the magnet would be changed and its magnetism greatly weakened. The polarity of a magneto-magnet should not be changed and care always should be taken in removing magnets from a magneto to see that the poles are marked properly in order that they may be correctly replaced.

Opposite poles attract each other, while similar poles repel, and the polarity of a magnet always can be found by holding the magnet near or over the poles of the electro-magnet. If, for instance, the south pole SP of the magnet M be held between the north and south poles of the electro-magnet, it will immediately be drawn to the north pole NP, and if the north pole of the magnet M were to be held between the two poles of the electro-magnet it would be drawn towards the south pole SP. The most reliable way to determine the polarity of the magnet is by means of a compass.

In using the remagnetizing device shown in Fig. 4 the operation is very simple, merely consisting of setting the magnet in place as shown and tapping it with a hammer held in each hand. The tapping is kept up for about 1½ minutes, and the magnet left in place with the current on for about ½ minute longer. Then a keeper, a soft iron bar, is placed across the ends of the magnet and the operation is complete. The keeper should be put on the magnet immediately upon removal, or before if possible.

There are two ways of using the other outfit. One is shown in Fig. 3. This consists of rocking the magnet back and forth for about 1 minute, then laying it flat with the ends pointing away from the operator and then reversing it so that the ends point towards the operator. The final operation is illustrated at A. With the magnet flat the keeper K is placed over the ends and the magnet withdrawn. The operation requires about 1½ minutes.

The other method is illustrated in Fig. 5. Set the magneto magnet on the electro magnet, then take hold of it as indicated at Y and brush it back and forth over the pole pieces of the electro-magnet, as indicated by the dotted lines. After being brushed back and forth from five to twenty times, lay the magnet on its side with the bend close to the electro-magnet and the ends protruding out in front of the pole pieces, as indicated by the dotted outline D.

Then draw the magnet backward until the ends are half way across the pole pieces of the electro-magnet, rock the magnet up onto the pole pieces into the position shown at Y, and swing it right over until the bend portion is on the side indicated by the dotted lines D.

This will bring the opposite edges of the magnet M in contact with the pole pieces of the electro-magnet. The magnet then should be rubbed back and forth once or twice with the magnet in this position so that this portion can be thoroughly saturated, and then rocked back into the position Y and over into the position indicated at Z again.

By this time the magnet should be thoroughly remagnetized, so all that remains to be done is to leave it rest in this position for a few minutes, put a keeper K across the opposite edges, as indicated at Z, then pull the magnet or, rather, slide it off and away from the poles of the electro-magnet, as indicated by the dotted outline E. The keeper K is not shown in this dotted outline, but it should be in place until the magnet is in contact with the pole piece which constitutes the base of the magneto from which it was taken.

PUMP NEEDS REPACKING

Council Bluffs, Ia.—In the next issue of Motor Age please answer the following questions: 1—How may I keep the water out of the crankcase on a model 10 Buick 1909. I have packed the pump with pump packing but without result. From all appearances the water follows the pumpshaft into the crankcase. I have threatened to change the system to thermosyphon but believe this to be injurious to the motor, as it was not built that way.

2—Does the Marmon Co. make its own motors? If not, what motor does it use?

3—What is the gear ratio of the model 40 Jackson 1910? Of the Maxwell 30 1908?—W. H. K.

1—The only way to keep the water out of the crankcase is to have the pump repacked by a repairman who can do a good job. The trouble seems to be due to poor packing and repacking will remedy it if well done. There is a chance that a leak exists in the wall of one of the cylinders, allowing water to seep through from the jacket.

2—The Nordyke & Marmon Co. makes its own motors.

3—The gear ratio of both the 1910 Jackson and 1908 Maxwell is 3½ to 1.

DYEING RED LEATHER BLACK

Des Moines, Ia.—Editor Motor Age—Kindly advise us if you know of a satisfactory dye to be used in changing the leather upholstering of a car from red to black. We would want something good and something that would make a permanent job.—R. J. Clemens.

Motor Age knows of no dye than can be used to change permanently the color of leather upholstering of a car from red to black. There are several dyes which will effect this change temporarily, but the color will come off in time, leaving a rather bad appearance, when it will be necessary to re-dye the leather. The Chicago Coach and Carriage Co., Chicago, markets a preparation for the purpose which will hold its color for some time.

MAKES DISCO SELF-STARTER

Rex, O.—Editor Motor Age—Would Motor Age please tell me who makes the Disco self-starter for motor cars and if they can be placed on any cars.—Subscriber.

The Disco self-starter is made by the Ignition Starter Co., Grand Rapids, Mich. It can be applied to any four or six-cylinder motor.

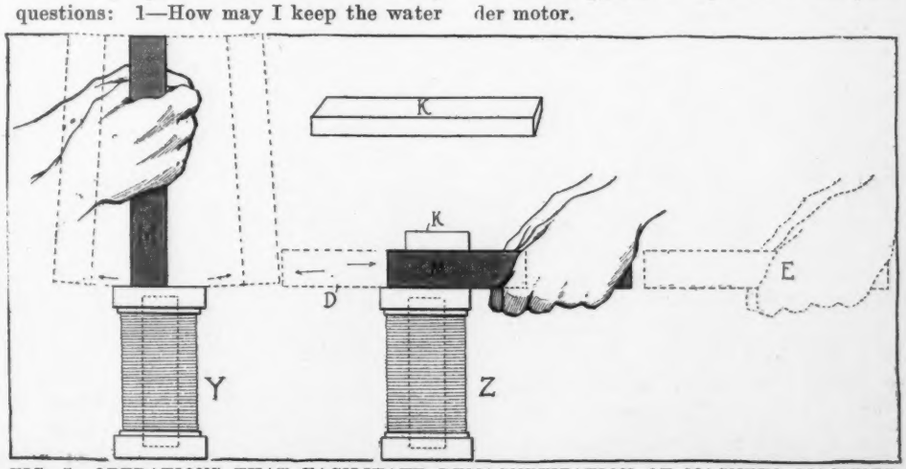


FIG. 5—OPERATIONS THAT FACILITATE REMAGNETIZATION OF MAGNETO MAGNETS

GARAGE AND SALESROOMS OF BAKER MOTOR VEHICLE CO. IN CLEVELAND

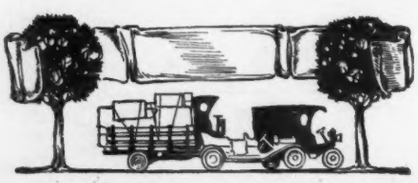
Electric Car Garage in Cleveland

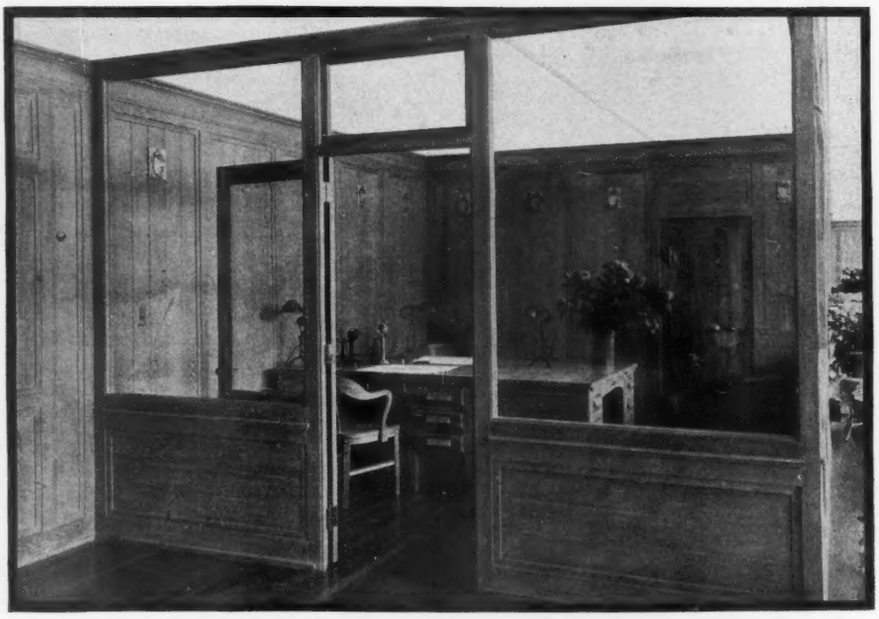
CLEVELAND, O., Oct. 23—Engineers, architects and motor car dealers who have visited the garage of the Baker Motor Vehicle Co. in this city unite in pronouncing it one of the finest and best equipped garages and salesrooms in the United States. The buildinig is situated on Euclid avenue, Cleveland's main thoroughfare, and is directly in the heart of the fashionable east end residence district. That the situation is ideal is shown by the fact that probably two-thirds of the cars owned in Cleveland are in the possession of persons living within a radius of 2 miles of this new garage.

The building, designed by Frank B. Meade, is an adaption of the Spanish renaissance style of architecture. It is built of tapestry brick and stone with square Spanish towers and red Spanish tile roof. The dimensions are 160 by 200 feet. Tapestry brick set in large size headers form frames around the handsome show windows on the Euclid avenue side. The front of the building is devoted to display and sales rooms.

The building sits 50 feet back from Euclid avenue and has a lawn and a red quarry tile terrace in front. Well-kept walks lead from Euclid avenue to the ornate entrance. The entrance has a copper marquee and the entire front is handsomely decorated with appropriate designs in Grueby tile.

The display rooms, 96 by 36 feet, have large plate glass display windows, brilliantly lighted with Frink reflectors, and are said to be one of the handsomest motor car showrooms in America. The interior was





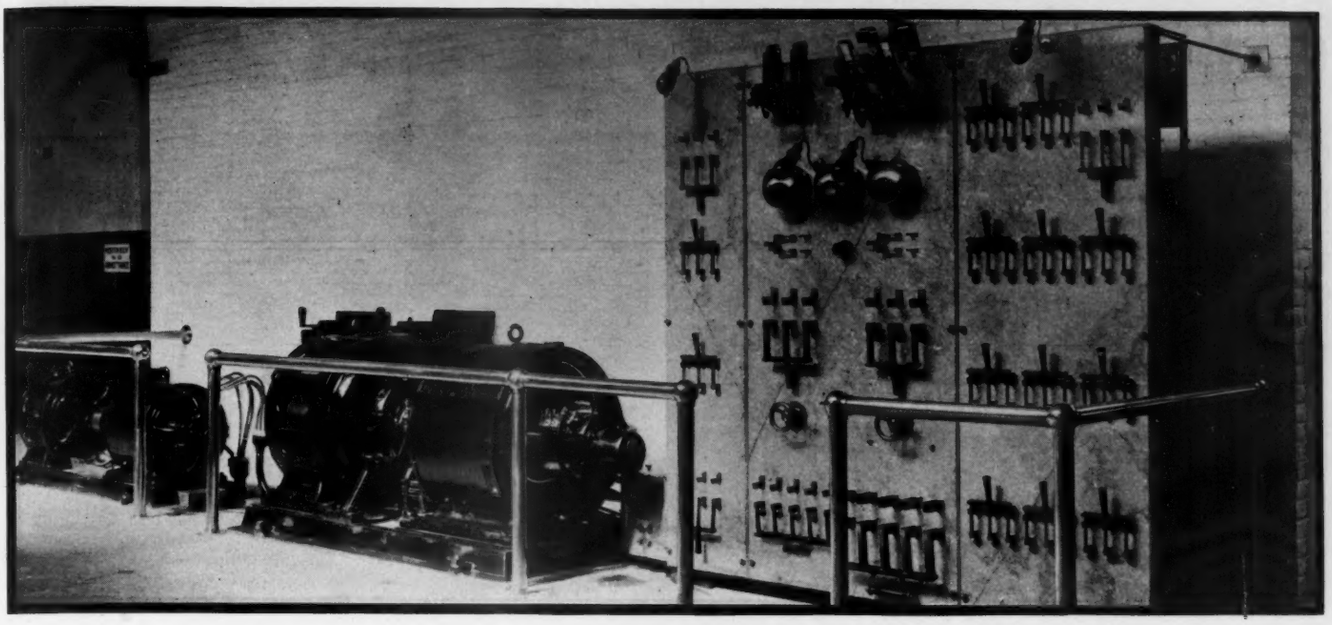
OFFICE OF BAKER ELECTRIC GARAGE IN CLEVELAND

decorated by the Rohrheimer-Brooks studios and is paneled in oak, finished in silver gray, with gray side walls, beamed ceiling and polished oak floors. The wall panels are decorated with carved wood crests. Massive hardware of statuary bronze is used throughout.

The office and reception rooms, furniture and office fittings are all finished in silver gray to harmonize with the general color scheme. The women's reception room is handsomely finished with silver gray willow furniture. It is provided with reading tables, writing desks, telephones, lavatory and other conveniences.

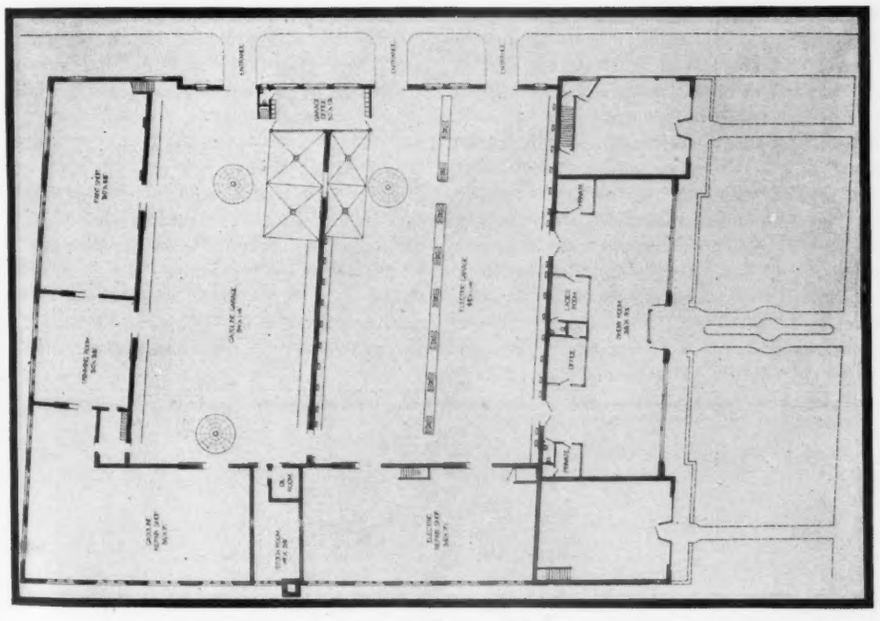
In the rear of the showrooms is the garage. The Baker garage is 120 by 70 feet, arranged in two bays, with four tiers, and has a separate entrance and exit. Immediately to the right of the entrance are the garage offices.

The garage is equipped with sixty individual charging stations and has a capacity of 100 cars. Its equipment includes two large wash racks with Perfect washers, a turntable and every facility for the care of electrics. The rheostats were especially constructed by the Baker company and the charging switches were designed for garage use. They are so arranged that either 75 or 150 volts can be obtained at any switch, and either one rheostat or two in series can be thrown in any station.



GENERATORS AND SWITCHBOARD IN BAKER ELECTRIC GARAGE IN CLEVELAND

Operated by Baker Is a Model One



FLOOR DIAGRAM OF BAKER ELECTRIC GARAGE

The interior of the garage is finished in white, with skylights, concrete floors and double fireproof doors separating all departments. Outside current is used, but two generators have been installed, one with a capacity of 75 K-W and the other with a capacity of 15 K-W. The switchboard is of gray marble, 7 feet high and 8 feet long.

The Baker repair shop, immediately in the rear of the garage, is 70 by 35 feet and is equipped with every facility. It is connected with the battery room in the basement by an elevator. The battery room is 50 by 35 feet in size and is completely equipped for testing, storing and recharging batteries. This department is under the direction of battery experts. The garage is also equipped with a paint shop and a separate tire room, where a full stock of tires is carried.

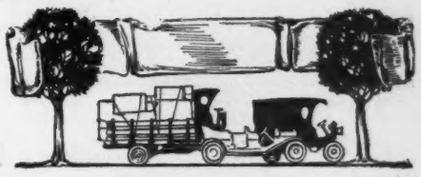
MOTORISTS' BOOKMAN

Lured by the memory of interesting things seen and experienced in a former trip through the Balkans, Roy Trevor and his wife made a second motor tour over and through the same wild but charming country, adding some hitherto unexplored regions. This trip is entertainingly related in a 365-paged volume which Mr. Trevor, the author, calls "My Balkan Tour." It might reasonably be entitled the call of the wild, so strongly does this region appeal to him, a country full of historic and political interest, peopled with characteristic and picturesque Moslem, Christian, Jew and Orthodox, each with his own custom, tongue and religion.

The Balkan states were entered at Marburg and the inland route followed through Agram, Novi, Banjaluka, Sarajevo, with a detour into the wild Albania frontier; the return trip following the beautiful Dalmation coast through Ragusa, Spalato, Zara to Trieste.

"The best months for motoring in Bosnia, Herzgovina and Montenegro are August and September; while for Dalmatia April and May are beautiful, as also are September, October and November. The climate is perfect, especially upon the coast."

In offering a few suggestions, from his own experienct, to the intending tourist, Mr. Trevor says, "I do not recommend any motorist to take his car there for the mere sake of motoring, or with any idea of enjoying long stretches of speed. The road traveler must be more than a motorist, he must be a lover of the old-world charm and novelty of his surroundings; his sympathies for the frightened and terrified drivers with their cattle must overcome his own personal annoyance: in a word, he must be willing to enter into the new conditions that this life entails." Withal these exigencies, and possibly many another, the joys and pleasures of motoring, according to the author, through this country with its medieval atmosphere is not to be surpassed. John Lane Co., New York. Price, $4.50.



Colby Underslung 1912 Type of Chassis

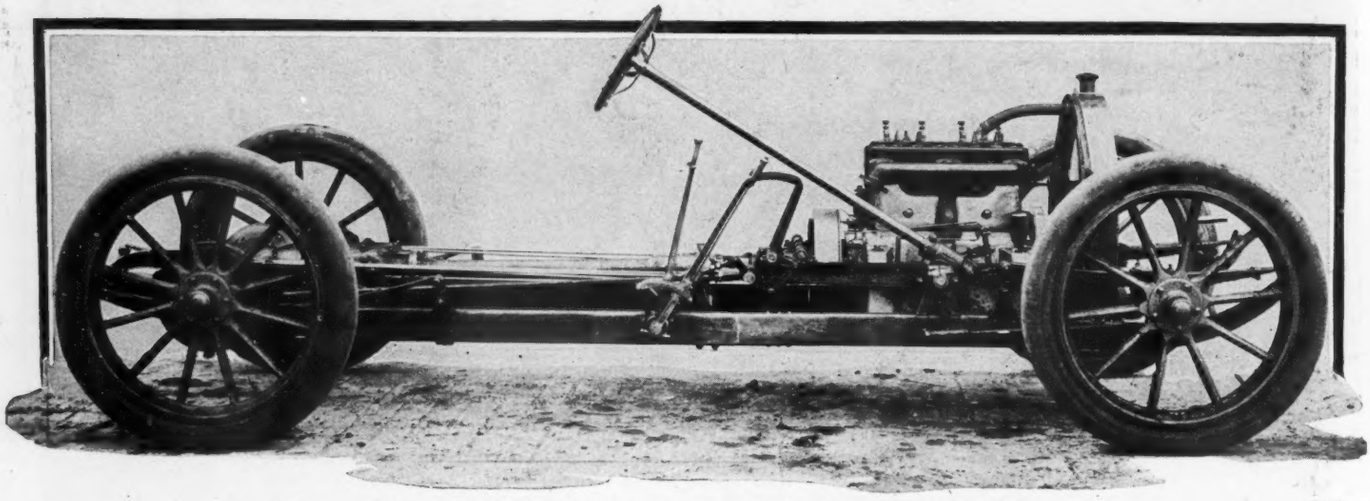


FIG. 1—SIDE VIEW OF CHASSIS OF COLBY UNDERSLUNG CHASSIS

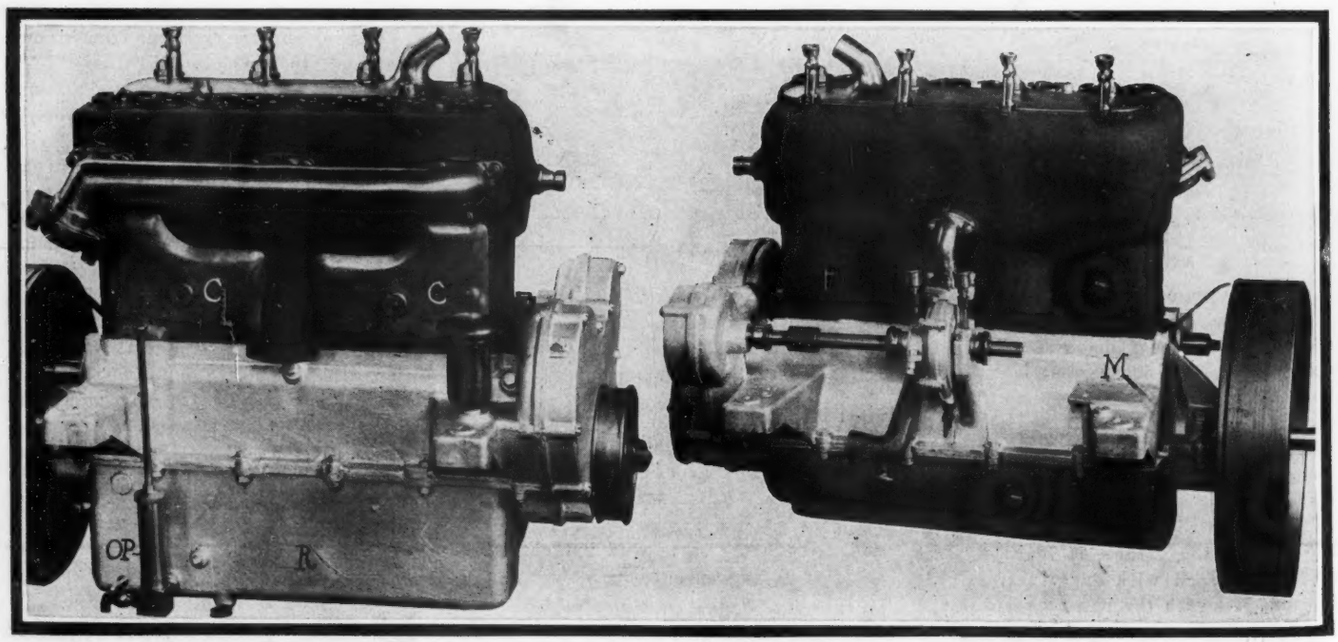
IN addition to the 40-horsepower chassis, which will be continued, the line of Colby cars for 1912 made by the Colby Motor Co., will include a 30-horsepower underslung chassis. This is called the model L chassis and in it are several features showing a departure from former Colby practice, aside from the underslung frame. The motor has four cylinders of 4 1-16-inch bore and 4½-inch stroke. The cylinders are of the L type with the valves on the right-hand side. Cylinders are cast en bloc with the inlet manifold an integral part of the cylinder casting. Each piston carries four compression rings above the wrist pin and has three oil grooves below. The pistons are balanced in pairs before assembling.

The motor is the product of the Falls Machine Co., weighs 375 pounds, and is rated at 25.6 horsepower by the S. A. E. formula. Some of the more important motor dimensions will give an idea of its construction. The pistons are 5 inches in length and the piston pin bearing, Z, Fig. 8, is 1 inch in diameter by 2⅞ inches long. The connecting rod bearings K, Fig. 8, are 2⅛ by 2⅜ inches in size. The crankshaft is 1¾ inches in diameter, the front bearing of which is 3½ inches, and the rear 4 5-16 inches in length. The valves are 1 9-16 inches in diameter, and the flywheel is 15¾ inches in diameter with a 3½-inch face. The camshaft is ⅞-inch steel.

Valves and valve operating mechanism are completely enclosed. The removable plates covering the housing of the push rods are shown at C and C, Fig. 2. The sectional view, Fig. 7, illustrates the construction of the valve actuating portion of the motor. The pushrods P act directly on the valve stems, which slide in guides G in the cylinder head. Each cylinder is provided with compression relief cocks C, which also act as priming cups.

The Ignition system

Ignition of the charge is by a dual system comprising a Splitdorf low-tension magneto and dry cells, acting through a single non-vibrating coil on the dash. The motor is water cooled, the jackets being cast integral with the cylinders. The water-jacket covers are exceptionally large, mak-



FIGS. 2 AND 3—RIGHT AND LEFT-HAND SIDES OF THE MOTOR OF THE COLBY MODEL L FOR 1912

At the left, Fig. 2, is shown the right side of the motor with the plates C covering the valve mechanism. Two features of the lubricating system are also indicated—the reservoir R and the cam-operated oil pump O P. The other side of the motor is shown at the right, Fig. 3, with the shelf M for mounting the magneto

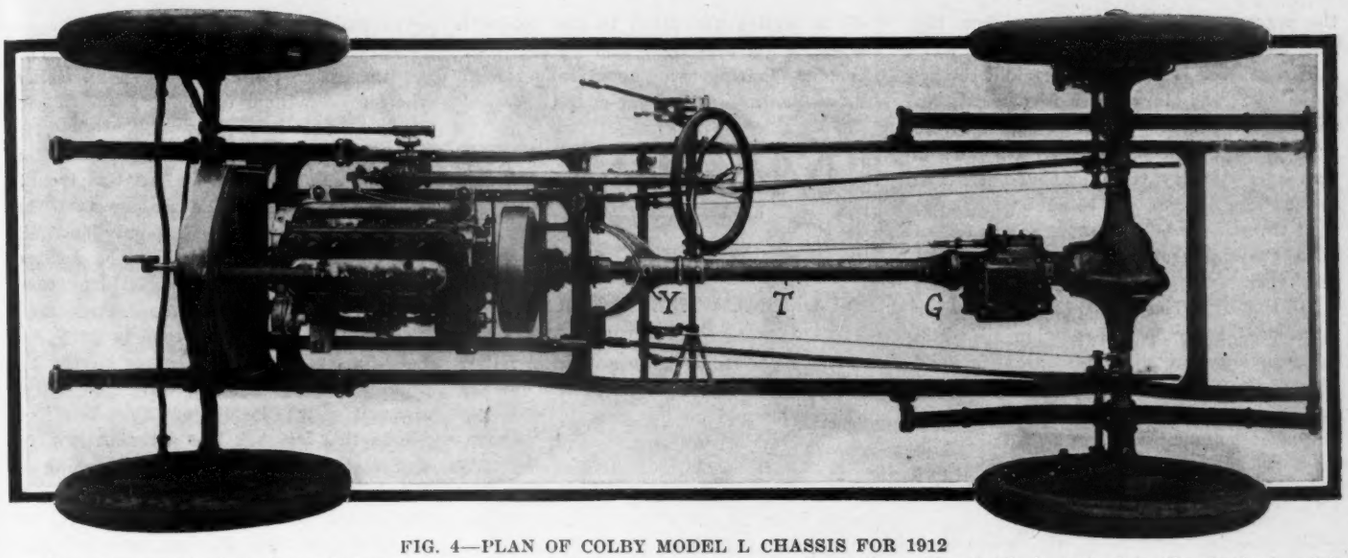


FIG. 4—PLAN OF COLBY MODEL L CHASSIS FOR 1912

The arrangement of the two-unit power plant and transmission is shown in this illustration. The clutch is incased in the flywheel and is therefore a unit with the motor. The gearset G is located at the rear axle. The torsion tube T ends in the yoke Y, hinged to the crossmember of the frame by the subframe hangers. Radius rods are used in addition

ing it an easy matter to clean out the sand from the interior of the castings. The radiator is of the square-tube type, located on an extra cross member in front of the one which carries the sub-frame. A centrifugal pump on the left-hand side of the motor base is driven from a layshaft from the timing gears. The layshaft is extended backward to drive the magneto. The arrangement is indicated in Fig. 2, M being the shelf cast on the base for attachment of the magneto. The fan is driven by a belt from a pulley on the crankshaft. A 1¼-inch Stromberg carbureter is used with gravity fuel feed.

Colby Lubricating System

Lubrication is of the circulating type and is effected by means of a plunger pump OP, Fig. 2, drawing oil from a reservoir R in the bottom of the crankcase. The crankcase has two petcocks and a glass indicator by which the proper oil level can be provided. The method of operation of the oil pump is shown more in detail in Fig. 7. Here it will be seen that the pump OP has at its upper end a shoe which bears against one of the cams on the camshaft. It is held against the end of the cam by a spring S which has its lower seat upon the flange by which the halves of the crankcase are bolted together, the pump passing through the flange. The oil is taken from the reservoir R through a strainer at the bottom of the pump. The plug P2 allows of draining the crankcase. In Fig. 8 is shown how the crankcase is extended backward over the rear bearing to form the ring R1 by which the oil is prevented from flowing out on to the flywheel. Leakage of oil here would not only be a source of waste, but might cause slipping of the clutch.

The cone clutch is incased in the flywheel, making the former a unit with the motor. It is of leather, the other friction surface being cast iron. The gearset is located on the rear axle, so that between it and the clutch is interposed a propeller shaft. A universal joint is placed between the drive shaft and the clutch, and the torsion tube extends from the gearset to a yoke around the joint. The ends of the yoke are attached to the middle cross member of the frame by heavy brackets, which form the subframe hangers. In addition to the torque tube the rear axle is braced with two radius rods extending to

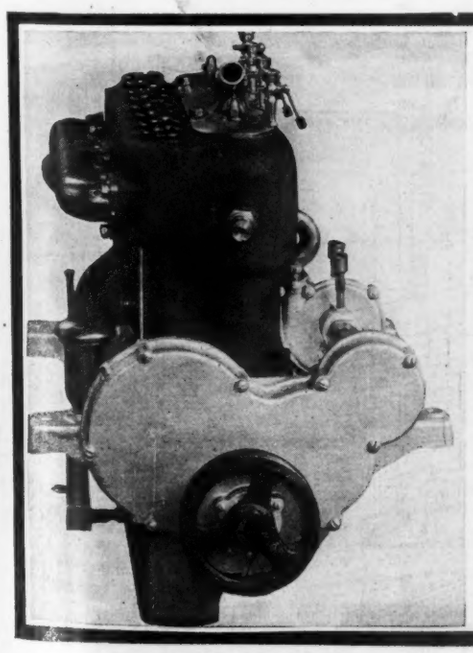


FIG. 5—FRONT OF COLBY MOTOR

This shows the method of housing the timing gears and the pulley on the end of the crankshaft for driving the fan

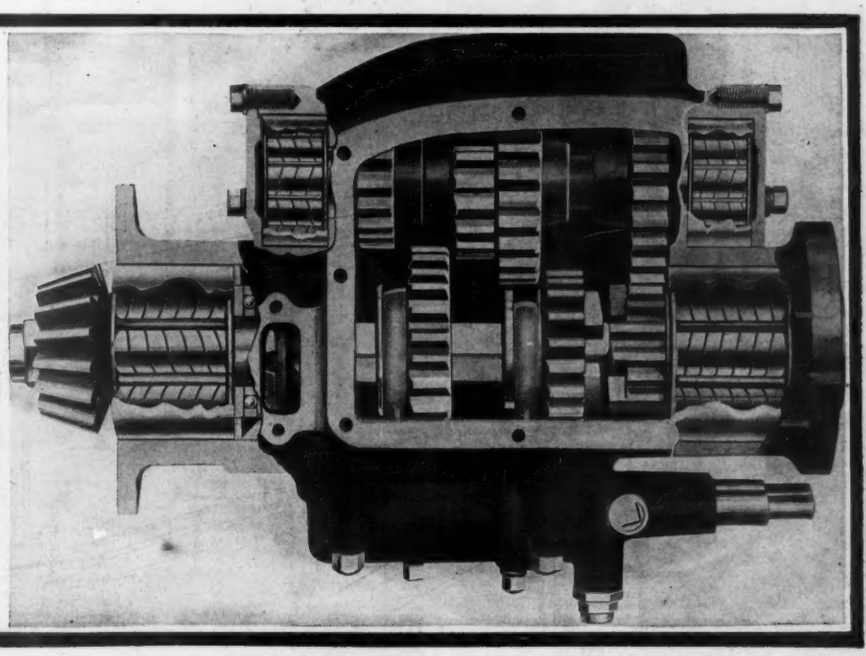


FIG. 6—GEARSET OF COLBY MODEL L

The gearset cover is removed to show the very compact design of this part of the transmission system. The bearing caps are broken away to reveal the arrangement of the roller bearings and the three-speed transmission gears

the pin on which the yoke turns from the rear axle.

The gearset is very compact and the removal of the large cover plate gives access to the gears. It is of the selective type giving three speeds forward, and is provided with Hyatt roller bearings. The rear axle is floating and roller bearings are used throughout. The frame is of pressed steel channel section, slung under front and rear axles on semi-elliptic springs front and rear. The rear springs are longer than usual, being 50 inches in length, while the front ones are 36 inches in length. The front axle is of the usual I-beam type, drop forged. The chassis is equipped in the usual manner with two sets of brakes, the service external and the emergency internal. Both emergency and service brake drums are 12 inches in diameter.

The steering gear is of the worm and pinion type, fitted with 16-inch, three-ply wheel. The spark and throttle hand levers are located in the steering wheel within easy finger reach. The control side levers are on the right-hand side with the gear shifting lever on the inside of the body and the emergency brake lever on the outside of the body. Foot pedals are placed on either side of the steering post with the foot accelerator between and the muffler cutout at one side. The muffler is very little larger in diameter than the exhaust pipe, but is said to be very efficient.

The wheels of the new Colby model L are of the artillery type, having ten spokes in the front and twelve in the rear wheels. They are equipped with 36 by 4-inch tires on demountable rims. The wheelbase is 116 inches.

Four bodies are fitted to the model L chassis, a five-passenger touring car, four-passenger touring car, two passenger roadster and a three-passenger coupe.

Manufacturers' Communications

SANTA MONICA TIRE TROUBLES

INDIANAPOLIS, Ind.—Editor Motor Age —We have received an authentic report from our team manager as to the number of tires changed on our cars in both the 301-450 class event and in the free-for-all at the Santa Monica road races. We find that in the 301-450 class event, Charlie Merz in a National 40 changed one tire only and we find that in the same event Harvey Herrick in a National 40 changed two tires. We find also that in the free-for-all on the same day Herrick in a National 40 made one stop and changed two rear tires only. In the same race Merz made one stop for water, but changed no tires.

We find also that in that same free-for-all race, Howard Wilcox, driving a National 50, changed ten tires. This was due to the fact that John Aitken, acting as team manager, instructed Wilcox to push the Fiat, driven by Tetzlaff, as hard as he could crowd it. The consequence was that Wilcox drove the course too fast to keep tires on his car, but he apparently accomplished what he was after, for while he changed ten tires himself, he kept the Fiat traveling at a pace that eventually resulted in troubles for the Fiat which caused it to finish away back in the rear, while it should have been the logical winner of the free-for-all race, it seems to me.

Motor Age gave the impression that Herrick had a great deal of tire trouble, when the fact of the matter was that Herrick changed two tires only and Wilcox in his National 50 had the bulk of the tire trouble for the National team.

Referring to the Fairmount Park races, some of the newspaper reports gave Zengel in a National 50 credit for having tire trouble in the third lap, while the fact of the matter was he did not have tire trouble in this lap, but lost a rocker arm pin and lost considerable time replacing it. He, however, changed three tires during the race. Disbrow in a National 40 changed two tires in that race and Herrick in the same race changed one tire, but was delayed a long time in about the twenty-third lap with a broken terminal in the magneto breaker box.—National Motor Vehicle Co., George M. Dickson, secretary.

MOTOR CAR LITERATURE

The Weston-Mott Co., Detroit, Mich., is making use of an 8 by 5½ size postal card to draw attention to its different factory departments in which the Weston-Mott axles are made.

The Hyatt Roller Bearing Co., Detroit, Mich., has recently issued a pamphlet discussing the physical characteristics of carbon versus chrome nickel steel, the latter being the product used by the company in its roller bearings.

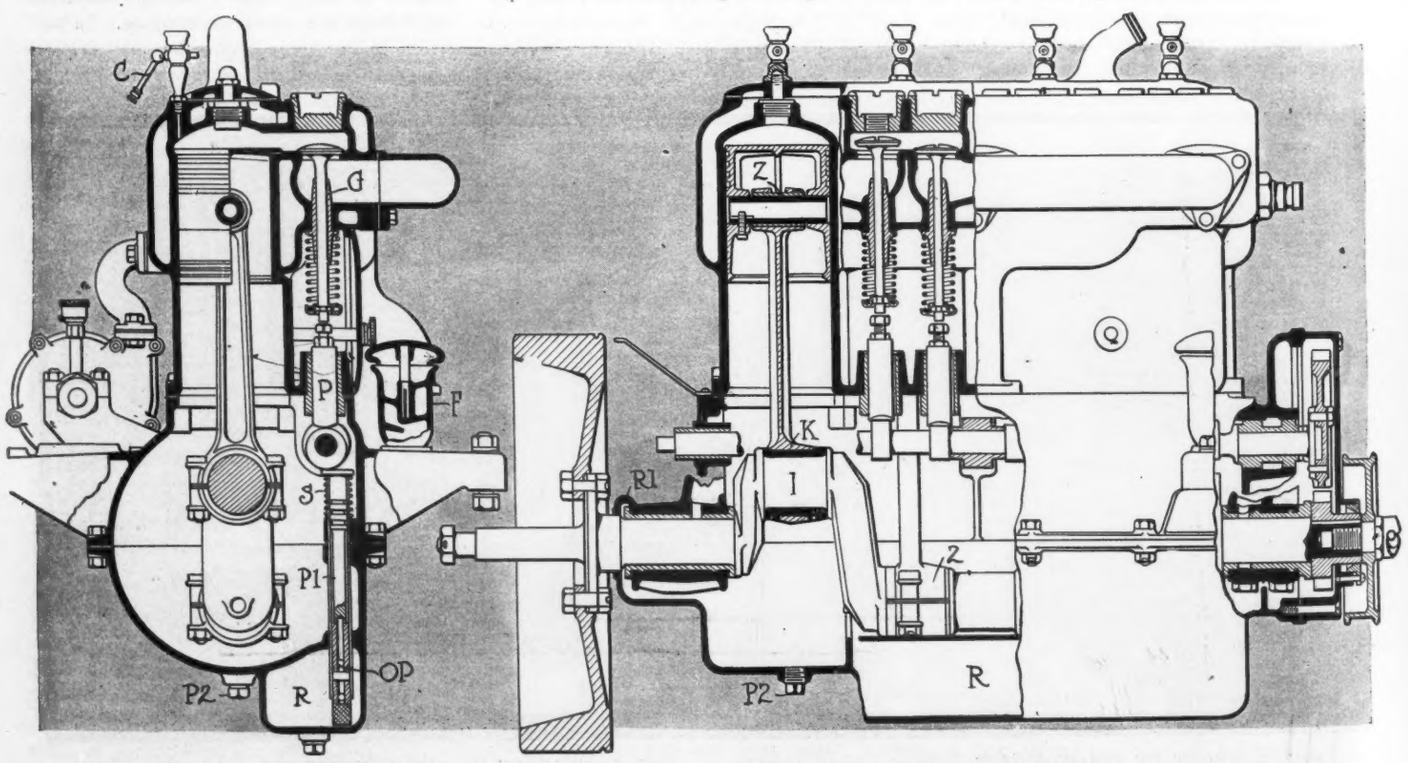


FIG. 7—MODEL L COLBY MOTOR

Both the valves and the oil pump OP are operated by the camshaft. The pump is of the plunger type and draws oil from the reservoir R

FIG. 8—SECTION OF COLBY MOTOR

The ample water-jacket space around the cylinder head is shown. The housing is extended backward over the rear crankshaft bearing at R1 to prevent oil from creeping onto the flywheel, thus doing away with a frequent source of loss

The Motor Car Repair Shop

A PROBLEM that confronts every garage or motor car agency is how to store the various extra parts of the motor cars in a systematic and simple manner. In Fig. 2 is shown the solution according to the Packard method in its stock room in Chicago. The parts are arranged in tall bins, or tills, divided off into various sized compartments to suit the nature of the articles to be stored in them. All tills are labelled, and by means of a lettering and numbering scheme and a simple system of stock-keeping records, it is possible for the man in charge of the stock room not only to know just where any desired article can be quickly found but also how many pieces are in stock. In the foreground on the left of this illustration is a table on which the various requisitions are kept in files. Just opposite this table but not shown in the photograph is the desk of the stock clerk. On a bench at the left near the windows are a series of stock records neatly arranged and readily accessible at any moment. The end of the bench is occupied by spindles containing various sized gears used in the motor and gearset. In the back of the room is shown the lockers in which tires and the like are stored. The rest of the illustration is self explanatory, and attention is called to the way in which almost every part of the stock room is utilized without the disorder characteristic of so many stock rooms.

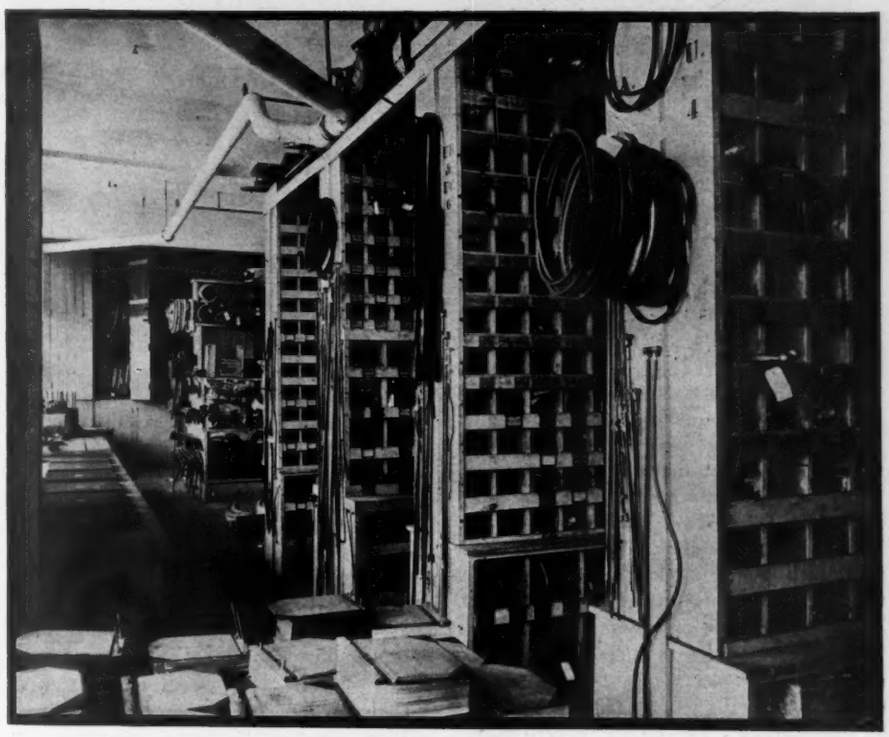


FIG. 2—A VERY FULL BUT SYSTEMATICALLY AND NEATLY KEPT STOCKROOM

Special Cleaning Room

There are many repair shops today in which no better facilities are provided for washing the various mechanisms of the motor car than the regular wash rack, which generally is of cement that is not at all suitable for holding delicate parts. Nor is the average washrack designed to be littered with grease and oil as it is when the transmission and rear axles or motor cars are cleaned upon it. In Fig. 1 the cleaning department of the Stoddard-Dayton repair shop in Chicago is shown. This rack greatly resembles the ordinary motor car washrack, except that it is made of wood with the boards converging or dropping toward the center. On this rack the motor car and transmission mechanism and crankcases of the motor, etc., can be handled in perfect safety. For smaller parts a square wooden basin lined with zinc is employed. This basin is shown in the center of the photograph near the partition which separates the cleaning department from the repair shop. A basin of this kind is a most desirable article of repair shop equipment. It is mounted on legs which brings it up to a height that enables a workman to assume a comfortable position when working over it, and more thorough cleaning of the parts results from this convenience. A gallon or so of oil in this basin and a daubing brush will enable a workman to thoroughly clean more motor car mechanisms or parts thereof than several gallons of oil and perhaps 2 or 3 pounds of waste, when used on the washrack. It, therefore, is an economic factor as well. In the background near the window is shown a tank for the gasoline and kerosene used in the cleaning operations, which is arranged where the oil is conveniently obtainable. At the left in this illustration is shown the arrangement of the motor-testing stand, the coil and wires of the ignition system being permanently arranged high up on the partition where it is accessible but still out of the way. Cooling may be effected either by a thermo-syphon system using the water contained in the barrel at the right or by a force circulation from the hydrant.

FIG. 1—A SPECIAL CLEANING AND ENGINE TESTING DEPARTMENT

From the Four Winds

ANOTHER Savannah Bonus—The Bosch Magneto Co. announces it will give $2,000 in bonuses at Savannah. The winner of the grand prize will get $500 if he uses a Bosch magneto.

New Bridge Almost Ready—About the middle of November a big good roads meeting will be held at Plattsmouth, Neb., to perfect an organization to boost the Omaha-Plattsmouth-Kansas City route. By that time the new $25,000 bridge across the Platte river will be completed, making possible a good road to Kansas City down through Nebraska.

Election at Norwalk, O.—A most interesting meeting of the Huron County Automobile Club was held at Norwalk, Ohio, when the annual election of officers was held, which resulted as follows: President, C. A. Paul; vice-president, W. F. Cooper; secretary, Harry Bennett; treasurer, I. W. Goodell; executive committee, C. A. Paul, Harry Bennett and F. W. Watson.

Indianapolis Counts Cars—From January 1 to October 20 there were 2,623 motor vehicle licenses issued by the city of Indianapolis. During all of 1910 there were 1,850 licenses issued, the annual license fee being $3. City Controller Wallace has recommended a new ordinance amending the license fees, fixing the licenses for runabouts at $3, for touring cars $7, and for trucks $10. All motor vehicles, regardless of size, now pay but $3 a year.

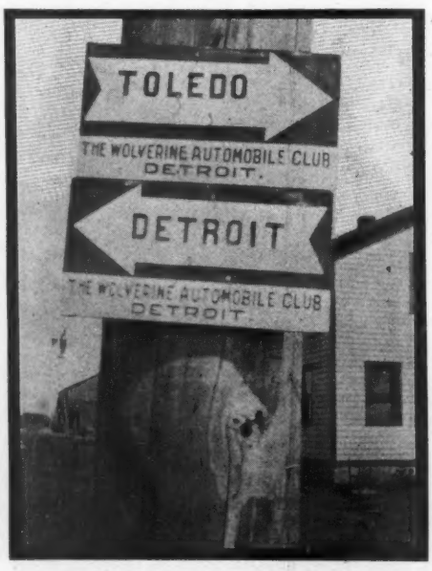
Means Roads for Mexico—President-elect Francisco I. Madero of Mexico has advised his friends that one of the policies of his coming administration will be to encourage in every possible way the construction of good roads throughout the republic. He has under consideration a plan for making large federal appropriations to be used in improving the highways leading out of the City of Mexico and in constructing new roads through the more remote mountain districts where travel by motor car is at present difficult.

Toledo Club Seems Certain—Splendid progress is being made by the promoters of the proposed new club for owners at Toledo, O., and it is now certain that a full-fledged organization will be in existence within a short time. Anticipating the need of a new club the Toledo Automobile Dealers' Association secured an option on a site for a new club-house. The location selected is a 6-acre tract fronting on the Maumee river, a mile and a half up the Grand Rapids road from Waterville, 10 miles south of Toledo and known as Gypsy Point. Leading business men who motor will be asked for charter memberships, and it is figured that 200 such members can easily be secured at $100 each, thus giving ample funds for needed improvements. It is probable that from $20,000 to $25,000 will be expended in this way the next few months.

Seeking Clubhouse Site — Representatives of the Automobile Club of St. Louis are searching for a site for a new clubhouse in St. Louis county. Several pieces of ground are now under consideration. The house will be erected through subscriptions from the members.

Wagner Replaces Nazzaro—The Fiat Automobile Co. announces that Louis Wagner has been selected to replace Felice Nazzaro as a member of the Fiat team in the grand prize race at Savannah on November 30. Nazzaro has been working for some time on a car of his own design, which, if successful, will be marketed. The Fiat men at Turin thought it bad policy to employ a driver whose sole interest was not with the Fiat car, and consequently felt obliged to reject Nazzaro's application to be a member of the Fiat team.

Farmers Join a Club—Owners of Vermillion county, Ill., have organized the North Vermillion Automobile Association, said to be the first of the kind in the west, the majority of the members being farmers. The North Vermillion association includes its members from the towns of Rossville, Hoopeston, Alvin, Bismarck and Henning and the farmers who are adjacent. Weekly meetings are to be held to discuss matters of general interest. Perry M. Warner has been chosen chairman and A. Sanders secretary. J. W. Warner, J. T. Zufall and F. M. Mason were chosen as a committee to prepare a constitution and by-laws. The new organization proposes to promote the welfare of motorists in every way possible.. The influence of the club will be exerted to bring about good roads, and there will be a steady application of pressure in this direction.



MICHIGAN ROAD SIGN
The Wolverine Automobile Club has marked highways around Detroit in this manner

Parade at Omaha—One of the features of the German day celebration at Lincoln, Neb., was a floral parade, in which fifty decorated cars took part. The first prize was won by Miller & Paine, the car being decorated in brown and red autumn leaves, four gilt pillars supporting a canopy, above which, in a large lotus flower, was a little girl. Mrs. Gillen and Mrs. Boney won second prize with a car decorated in roses and green leaves. Above the tonneau a rose arbor was erected, latticed work being covered with rosebuds. The next day an industrial parade was held, many of these cars also taking part in that.

Insist on Improving York Road—Residents of Govans, Baltimore county, Md., are up in arms against the good roads commission of Maryland because they believe they are not getting a square deal when it comes down to apportioning sums of money from the state for good roads in their section. Consequently at a meeting they expressed their disapproval about the proposed loan of $1,500,000 for improved roads in the county, to be voted on at the state election next month. The residents of Govans will ask the Baltimore county candidates for the legislature to vote against the proposed additional state loan of $5,000,000 for good roads unless it is specified that York road, in Baltimore county, will be taken over at once by the state and properly improved.

Big Nebraska Meeting Called—Following a successful summer of organization, a convention of the Nebraska Automobile Association members will be held in Omaha the first Monday in December. The organization only was formed in February of this year. During the summer D. E. Watkins, secretary of the organization, has visited fifty-one counties in the state, and all of those counties have formed clubs and joined the state association which became affiliated with the American Automobile Association. The total membership now is about 3,000. The association this year has been working for the improvement of one road between all towns of any importance in the state, using the money from the car licenses for this purpose. A guide book is being prepared by the association, giving maps of all of the best roads between towns. The issuing of this book has been de-

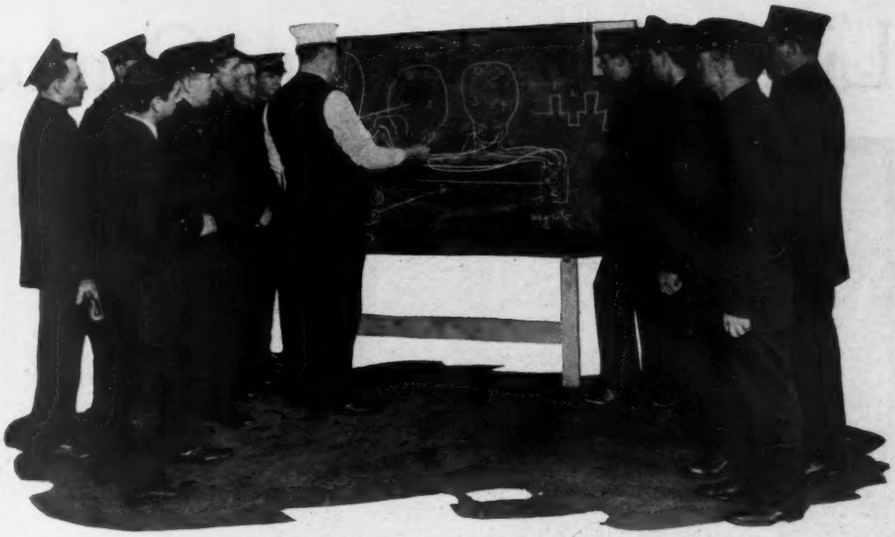
layed because some of the state roads in Nebraska have not been definitely located.

Baltimore Road Improvements — The new Annapolis-Baltimore boulevard will be completed by December 1, according to information received by Secretary H. M. Luzius, of the Automobile Club of Maryland. He also has been informed that the right of way of the unfinished Washington boulevard between Contee and Beltsville has been obtained. He will communicate with Chairman Tucker, of the good roads commission, to ascertain when work on this thoroughfare will be resumed. These roads will be posted by the club as soon as completed, as will the new highway between Conowingo and Newark, Del.

Marmons Entering at Savannah—The Nordyke & Marmon Co., of Indianapolis, will have two cars in the Vanderbilt cup race at Savannah on November 27. The two cars will be Marmon 36, practically the same as the regular production of the Indianapolis factory, with the exception of a larger motor. One of the Marmons will be driven by Bob Burman, and the other will have as its pilot Joe Dawson. In the Savannah challenge race 231-300 class, to be run on the same day, there will be two Marmon 32 cars entered. Cyrus Patschke will be one of the pilots, and Joe Nikrent will be at the wheel of the other Marmon.

Plans Historical Parade—Novel indeed are the suggestions made by the executive committee of the Richmond Automobile Club for decorated cars during the convention of the National Highway Association at Richmond, Va., the week of November 20. It is proposed to make the parade historical, depicting the men who settled Jamestown, the red men who watched them, the men of the time of Bacon's rebellion, Governor Berkeley, Patrick Henry, John Marshall and "Light Horse" Harry Lee. The idea would be to put these historic men in motor cars and take them over the road to Petersburg and let them see the scene of the battle of the crater, and other historical points. President Taft has given every assurance that he will attend the big highway meeting.

After the Railroads—Two recent grade crossing accidents, one taking a toll of fourteen lives and another of five, have renewed agitation in Wisconsin that all railroad grade crossings be abolished. The Wisconsin state railway commission is making an investigation of all the principal grade crossings in the state, and it is confidently expected that orders will be issued to all railroads to immediately improve conditions, either by placing gates or watchmen at the crossings or raising the grade above or decreasing the grade below the street. There are several bad grade crossings near Milwaukee, where during the last 5 years no fewer than ten motorists were killed and a hundred or more injured. These will probably receive early attention because the heavy motoring traffic makes it imperative that conditions be remedied.



MAKING MOTORISTS OUT OF NEW YORK FIREMEN

The above illustration shows New York's chauffeurs' school for firemen, started the latter part of last August to give instruction to several hundred regular members of the force in the theory and care of motor vehicles and their operation in the streets. The fire department of New York will advertise for bids for furnishing upward of 150 pieces of motor-driven apparatus to be bought next year and wants to have enough competent drivers on the force to handle them. A special appropriation of more than $700,000 has been made to cover these purchases

Now It's a Motor Picnic—The Superior Motor Club, of Superior, Wis., recently introduced a new type of social touring by giving a motor picnic in the evening. Thirty cars filled with members and their friends drove from the clubhouse to the village of South Range, 12 miles away. The villagers turned out en masse and gave the visiting motorists a glorious time. A ball was held at the village hall in their honor. It was the first club tour of the Superior organization, which is only of recent origin. The idea has made a hit with motorists.

Lights Alone Not Sufficient—A legal question of more than ordinary interest was decided by an Ohio circuit court last week. The action was brought against the county commissioners of Marion county by Joel Shaw, treasurer of the county, who was injured a year ago when his car plunged through an open bridge which had been insufficiently protected. The circuit court holds that it is not sufficient to place lanterns at night where roads are unsafe, but that it is the duty of the county commissioners to construct barricades which will protect motorists and others using the highways at all times. The decision has caused considerable comment.

Sending Out Good Roads Train—Announcement has been made that the Atlantic Coast Line Railroad will operate a good roads train over its entire system, beginning at Richmond, Va., Thursday, November 23. The train will consist of two coaches, one of which will contain models, operated by electricity, of road-working machinery of various characters and kinds of roads. The other coach will be equipped for lectures and stereopticon views. A private car will accompany the train for the use of the lecturers. The train will make from one to two stops in each county in the states of Alabama, Virginia, North Carolina, South Carolina, Georgia and Florida through which the Atlantic Coast Line passes. The object of the train is to stimulate interest in better highways.

Harrisburg's Economy Run—The Motor Club of Harrisburg, Pa., will hold an economy contest on Monday, November 13, covering a distance of 90 miles. There will be two classes of cars, one for private owners and the other for dealers and manufacturers. In the owners' class only the gasoline consumption will be considered, but in the dealers' and manufacturers' class the consumption of oil also will count a prominent part, and the cost per passenger mile will be determined. The route of the contest will lead through Dillsburg, Abbottstown, York, Wrightsville, Columbus, Marietta and Mt. Joy over good roads.

Passing of the Tollgate—The city of Baltimore no longer will be hampered by tollgates, for the last one—that on the Reisterstown turnpike—has been purchased by the state of Maryland. The directors of the Reisterstown Turnpike Co., owner of the tollgate, decided at a meeting last week to accept the offer of $70,000 made by the good roads commission for the rights, titles and interests of the turnpike in the city. The gate is located on Park Heights avenue, near the Druid Hill park entrance, and is the only available thoroughfare for vehicles, other than those used for pleasure, in that locality. The commission will raze the toll house and remove the gate when it assumes control, after the proper legal proceedings.

Line of Stegeman Company's Trucks

FIG. 1—THE STEGEMAN TRUCK AS IT APPEARS READY FOR SERVICE

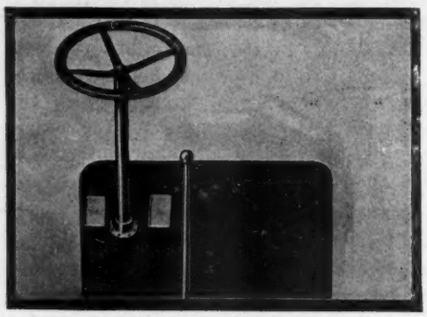


FIG. 2—SIMPLICITY OF CONTROL

A UNIT power plant, means of automatically governing the speed of the engine and car, inclosed driving chains, excellent traction advantages, an unusually simple left-hand control, and general accessibility, are some of the distinctive features of the Stegeman motor trucks which are made by the Stegeman Motor Car Co., Milwaukee, Wis. These trucks are manufactured in a range of sizes from 1 to 6 tons capacity and, as shown in the accompanying illustrations, the chassis is one of the simplest on the market.

One of the most important features of these trucks is that on a capacity load, 80 per cent of the load is on the rear wheels. The advantages claimed for this design are that it gives maximum traction, lightens the weight on the front wheels, and offers minimum road resistance. It furthermore makes steering easy and by the use of lighter springs over the front wheels eliminates all undue jarring to both motor and driver's seat, thereby lengthening the life of the power plant and greatly increasing the comfort of the operator.

As shown in Fig. 4, the Stegeman truck is distinctly a unit construction; the motor, transmission gearset, and clutch being combined by a single aluminum casting. With the service brake placed directly back of it on the forward end of the propellor shaft, all troublesome gear-shift connections as well as clutch and brake rods are eliminated. The gear-changing lever works directly into the gearset which is located immediately beneath the floor board, and the clutch and service brake are operated by the same pedal, which precludes the damaging effect of applying the foot brake without or before releasing the clutch.

Another important feature of this construction is that all operating parts are fully inclosed and run in a lubricant of either oil or grease. This keeps out the dirt and grit; and combined with a system of compression grease cups provided on all spring shackles, brake connections, and control pedals, wear is eliminated to a very high degree. This feature in connection with the general accessibility and simplicity of the car throughout tends to encourage the operator in its care, cuts down upkeep expense and adds to the life of the truck.

Every effort has been made to render the truck fool-proof. A speed governor of the fly-ball type inclosed and sealed limits its maximum speed. This limitation is to insure the owner against abuse from overspeeding which is claimed more injurious than the abuse of overloading.

As shown herewith, the motor is of a four-cylinder water-cooled vertical type. The cylinders of the motor are cast en bloc and of L type design with valves all on one side and with the valve springs and lifters enclosed. The motor might be termed a long-stroke motor, inasmuch as the cylinder dimensions in the 1 ton truck are 3¾ by 5¼ inches. The motor is designed especially for heavy truck duty; and the long stroke is an important feature as it not only makes for greater economy in gasoline consumption and less wear of its own parts, but it also has the important advantage of a long

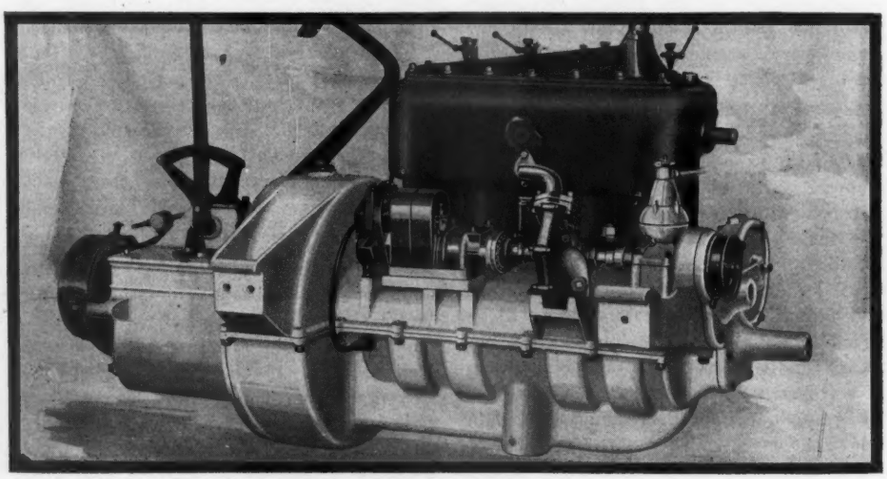


FIG. 3—RIGHT SIDE OF STEGEMAN UNIT POWER PLANT

Covers Range of from 1 to 6-Ton Wagons

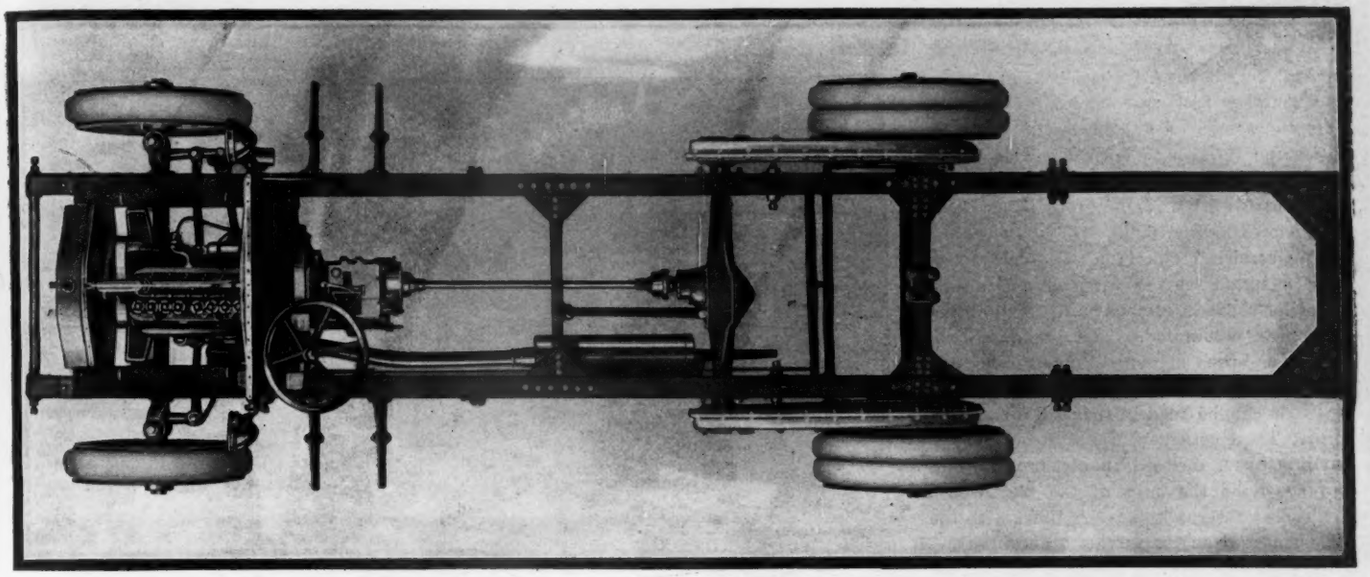


FIG. 4—THE CHASSIS OF THE STEGEMAN TRUCK SHOWING SIMPLICITY OF ITS DESIGN

and steady pull with great reserve power for heavy loads and hills. The cylinders are reamed and ground. Pistons are extra long and fitted with eccentric expansion rings. The crankshaft is made from special alloy steel, toughened and hardened by a special heat-treating process. It is mounted on three plain bearings with special thrust bearings at the forward and rear ends which take up the thrust of the clutch to prevent end wear and end play in the crankshaft.

The aluminum casting which forms the base and crankcase of the motor and incloses the flywheel, clutch and gearset, is divided horizontally so that the lower half as far back as the clutch can be readily detached for inspection and adjustment of the bearings.

Lubrication of the motor is by means of a patented double-plunger pump which supplies streams of oil under pressure to the helical engine gears and to the connecting rod bearings. The crankshaft and pistons are oiled by splash from basins which are fed from a 4-gallon oil reservoir in the base of the crankcase. The splash section of the base has four separate compartments to prevent the possibility of oil running to one end of the motor when on hills; and there is an overflow in each splash compartment by means of which the proper level is maintained in each. The oil which overflows is conducted to the reservoir, where it is filtered before being recirculated.

In the cooling system a flat tube radiator is employed, assisted by a centrifugal water pump, and a large one-piece fan which is belt-driven and adjustably mounted.

Ignition is by means of a single jump-spark system with current furnished by an automatically governed and timed Eisemann magneto. The equiping of the magneto with a governor which automatically advances the spark, not only relieves the operator of this duty but is claimed to be far more efficient than the judgment of any ordinary individual. It prevents racing of the motor, improper timing, and pounding of the engine.

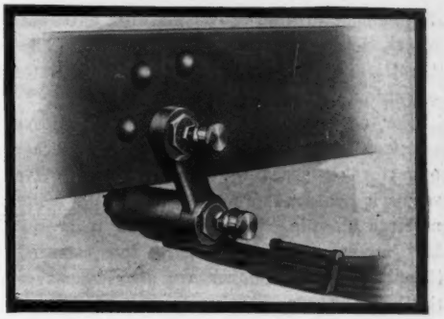


FIG. 5—STEGEMAN SPRING SHACKLE

A multiple-disk clutch of the dry-plate type is used to transmit the power from the motor to a selective type of sliding gearset. The gearset gives three forward speeds and reverse, is short and compact in design, both shafts are in the same vertical plane and mounted on annular ball bearings.

A long shaft with two universal joints transmits the power from the gearset to the bevel gears of the so called floating type of jackshaft, and from this jackshaft, whose mechanisms are inclosed in a pressed steel case, the power is transmitted to the rear wheels through heavy side chains, which also are inclosed and run in oil. The entire inclosing of driving chains and sprockets permits of their thorough lubrication and insures freedom from all dirt and grit so detrimental to the life of the uncovered chains and to the silent operation desired. The chain covers are made of strong steel castings provided with adjustments to serve as a radius rod.

Both front and rear axles are made of high-grade axle steel forgings and the pivots of the front steering knuckles are mounted

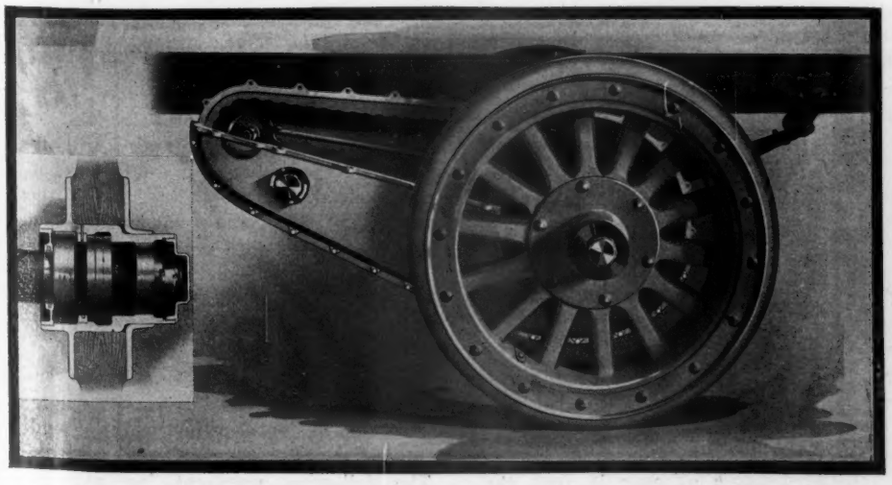


FIG. 6—STEGEMAN WHEEL BEARING AND DRIVING CHAIN HOUSING

The Realm of the Commercial Car

on ball bearings. All wheel bearings are of the annular ball type and provided with thrust bearings of a liberal size, which reduces the friction to a considerable extent. All lateral or side thrust in the wheels is taken care of by the separate thrust bearings shown in Fig. 6.

The service brake is of the contracting type mounted on the forward end of the propellor shaft in a manner in which all lost motion is eliminated. The brake is lined with non-burn asbestos composition and located immediately below the footboard, where it can be readily reached for adjustment. The emergency brakes are of the expanding type, inclosed in dirt-proof drums and act upon the hubs of the rear wheel. The shoes of these brakes are lined with the same material as the service brakes.

As shown in Fig. 2, the steering column and wheel are free from throttle and control levers. An Eisemann magneto with an automatic advance governor eliminates the spark lever on the steering wheel. The throttle is controlled by a foot accelerator of unique arrangement.

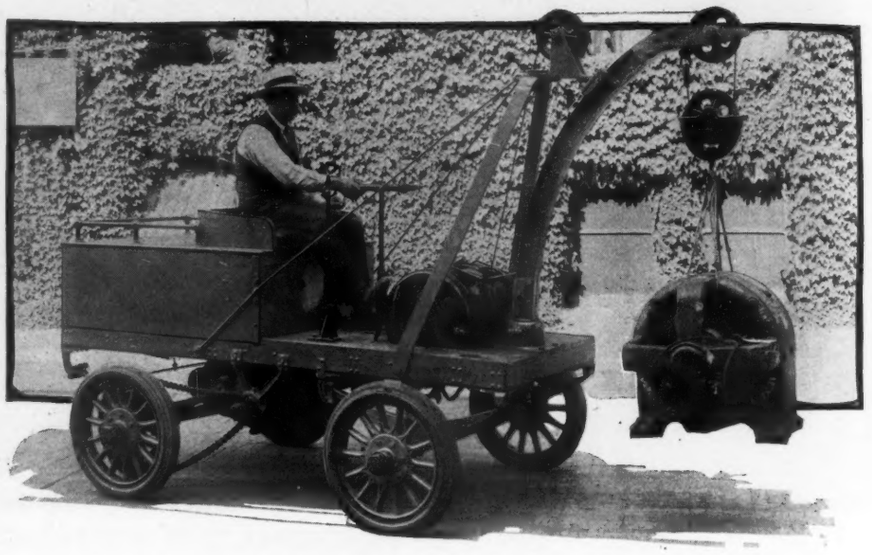
For commercial work, where the service requires frequent getting on or off of either operator or assistant, the left-hand drive seems logical and practical, as it allows immediate stepping to the walk or platform. Its advantage is further demonstrated through congested downtown districts where the law obligates passing to the left.

The absence of hand, spark and throttle levers and emergency brake greatly simplifies the control and leaves the operator more freedom in watching the road. The clutch and service brake are on one pedal, the left pedal being for the emergency brake on the rear wheels.

On the 1-ton trucks the wheels may be equipped either with solid tires, or with pneumatics and demountable rims. Dual rear tires are employed on all trucks designed for more than 1-ton load.

NEW UNIVERSAL TRUCK BODY

A new type of body has been gotten out by the Universal Motor Truck Co. for its 3-ton truck, this body being intended for heavy hardware, plumbing and lumber haulage. It has a load capacity of 6,000 pounds and has a body known as a slatted removable gate type, each side of the body being three removable gates. In order to accommodate this body a specially long chassis has been used and is made in two lengths: the first length has a wheelbase of 11 feet, and the length of the body back of the seat is 12 feet 4 inches, with a uniform width of 6 feet, giving a surface carrying space of 74 square feet. The long chassis has a wheelbase 12 feet 6 inches, and the body length back of the seat is 15 feet 8 inches.



BATTERY TRUCK CRANE WITH SHORT BOOM AND ONE-TON LOAD

Battery Truck Crane

THERE is one field of commercial work in which the motor car has not been employed to any extent. That is in the work which may strictly be called short-haul service, where the time required for loading and unloading is much out of proportion to the time consumed in the actual transportation of the goods. This includes the handling of freight and materials which have to be lifted and moved through moderate distances, as at the great railway and marine terminals and in manufacturing plants.

To provide a motor car for this service the General Electric Co., Schenectady, N. Y., has brought out an electric vehicle which has a swinging crane mounted on the front end. It is called the battery truck crane, and a storage battery supplies current to motors on the driving wheels and also to a motor which operates the crane hook. The length of the crane boom depends on the service for which it is intended, but it is usually capable of elevating loads 10 or 12 feet. A comparatively short wheelbase allows the vehicle to be used in the aisles of factories and other places where short turns are required.

The battery truck crane is designed to be employed to advantage in three classes of service: hoisting, hoisting and carrying loads on the hook, and towing trailers. In cases where material which may be subdivided into parcels of 1 ton or less has to be deposited within a 6 or 8-foot radius, and this action does not require that the parcel be moved through a vertical distance of over 10 feet, the brakes are set, and the vehicle remains stationary as the boom of the crane move back and forth between the picking up and depositing points. In this manner the crane may be employed to load or unload cars, wagons, power trucks, trailers, lighters, etc.

When material, in small or large quantities, has to be moved less than 400 feet or, in small quantities, to any distance, the article is lifted by the hook, conveyed to its destination by the vehicle, and placed as desired. This may be described as a pick-up-and-run method and is shown by the illustration.

For the miscellaneous transfer of large quantities of package freight or other material through a distance over about 400 feet, the best procedure is to use the battery truck crane to tow trailers in trains of about four. To secure the best results there should be a train loading and another unloading while the machine is on the road between, thereby eliminating any waiting, for, as soon as the load is delivered, the vehicle immediately starts out with the empties from the previous trip. The number of trailers per train and the number of trains will depend upon the distance, character of load and time taken to load and unload the trailers. Twelve is the usual number, and these are divided into three trains. Thus the battery truck crane keeps 600 square feet of loading truck working to its maximum capacity. This would be equal to a single vehicle 5 feet wide by 120 feet long, or to twelve individual power-operated trucks, each having 50 square feet of space for carrying material and merchandise.

The following represents an average week's work at towing trailers in the

Bush Terminal, New York, deduced from the logs of a number of these machines operating over a long period:

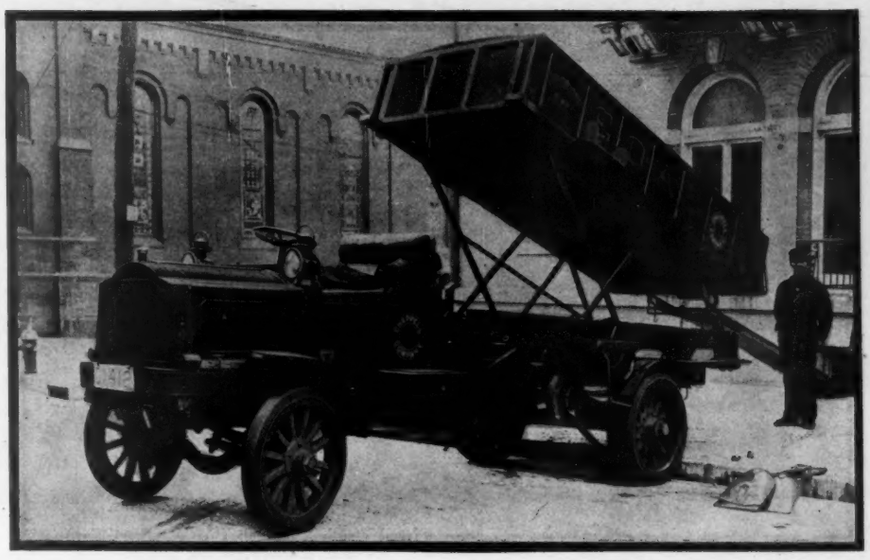
Number of packages handled	7,570
Average weight per package, pounds	230
Total weight handled, 900 tons, pounds	1,720,000
Average distance packages were moved, feet	900
Per cent of total time machine was working	80
Packages delivered per working minute	3
Number of different jobs worked on	30
Heaviest single load drawn, tons	12½
Cost of operator, interest, depreciation, power	$24.00
Cost of moving one package 900 feet	⅓c
Cost of moving 1 ton, 9 packages, 900 feet	3c

Six hundred thousand pounds of cotton have been moved ½ mile in a 10-hour day, taking twenty-four bales per load and making a round trip every 12 minutes. This gives an average of two bales—500 pounds each—per minute moved a distance of ½ mile. On a hurry order for cotton, forty-eight bales or 12 tons were delivered alongside the lighter within 25 minutes after the order was given. One battery truck crane, using three trailer trains of two cars each, has moved 1,000,000 pounds of small package freight—canned salmon—600 feet in 19 hours, it is claimed.

The battery truck crane is designed for a high draw bar pull, its maximum being a pull of 2,000 pounds and equal to that of a 5-ton locomotive on rails, and to readily handle loads of from 5 to 8 tons on trailers.

Trailers of special design, having a capacity of 3 tons, are employed in this work. The wheels are 24 inches in diameter by 5 inches face, and have roller bearings. The deck is 12 feet long by 4 feet wide, and is 29 inches from the ground. The heavy towing tongue readily couples to the vehicle or to another trailer, and no trouble is experienced in towing a large number around obstructions, as they follow perfectly in the course of the battery truck crane, experience has demonstrated.

The crane is equipped with special attachment to suit the character of the work contemplated. These consist of rope and chain slings, barrel tongs, bale grapples, box hook, snatch blocks and small tools.



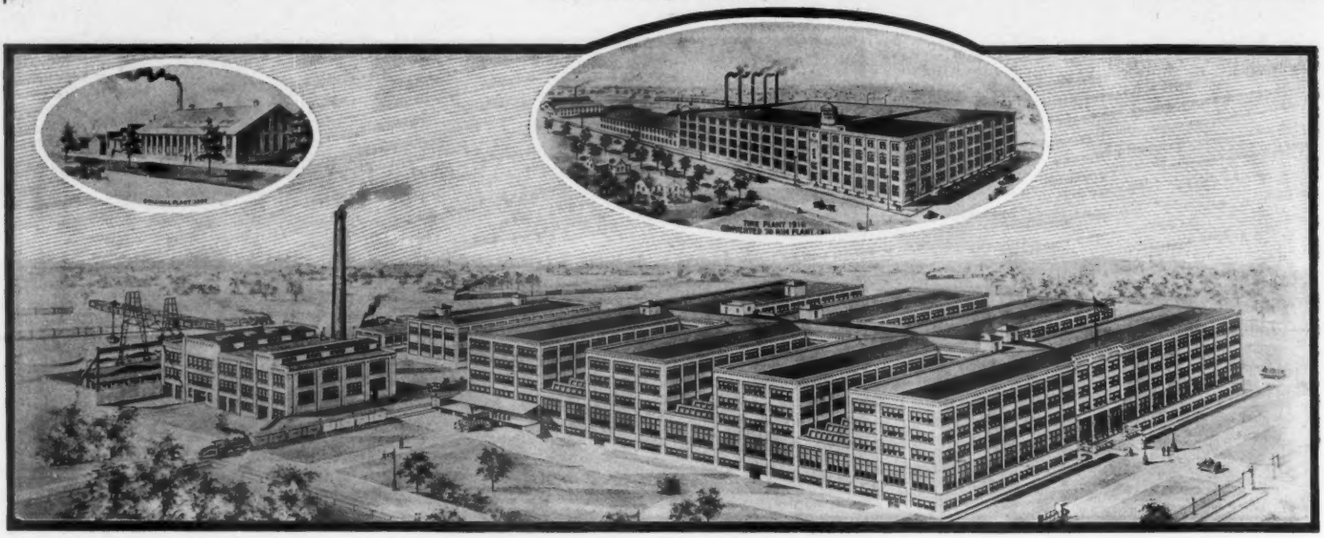
PACKARD COAL TRUCK USED BY CHAPPELL COMPANY

PUT TO PRACTICAL USES

A novel arrangement for making a donkey engine out of a motor car has been in operation the last few weeks in Tacoma. A. Gehri & Co. have been putting a new roof on the county court house, and it required that new materials be raised several hundred feet to the top of the tall towers and lower the old tin plates that formerly did service as shingles. The company has for some time used a little Cadillac runabout, but it has assumed another job. A drum, or large wooden reel, equal in circumference to the rim line of the left rear wheel, was so constructed that by a moment's effort it could be attached or detached from the hub of that wheel. A rope was attached to it, and by throwing in the clutch on the low gear either forward or reverse, the raising and lowering of considerable loads was accomplished.

A most novel motor craft guided by F. A. Hanson, of San Jose, Cal., recently rolled into the Kissel garage of Los Angeles. It was a heavy and interesting object. A special body had been installed upon a 50-horsepower Kisselkar chassis, and this body contained a complete demonstrating outfit of the Bean Spray Pump Co., of San Jose. Mr. Hanson is making demonstrations of the uses of the spray pumps throughout the large orchards of California, and is going as far south as the Mexican border. The car carried a load of 3½ tons, the front tires being 37 by 5, while the rear tires are duals. Beside the driver's seat there is an open tank containing several gallons of water, two power pumps with stationary gasoline engines for furnishing the power and also one hand pump. Upon reaching an orchard the gasoline engine is set to work, the pump put into operation and the farmer shown how easily and economically his orchard can be sprayed. This outfit is the only one of its kind in the world and is indeed an object of interest.

BATTERY TRUCK CRANE AND STANDARD TRAILERS



FIRESTONE PLANT, PAST AND PRESENT

The new plant now occupied by the Firestone Tire and Rubber Co. of Akron, Ohio, illustrates the growth of the tire industry. This company started to make tires less than a dozen years ago in the diminutive factory shown in the upper left corner of the illustration, employing only a score of men. The new plant, covering many acres of ground, employs thousands

Among the Makers and Dealers

CHANGE of Name—The Union Sales Co. is the new name chosen by the Eagle Motor Car Co. of Columbus, Ohio, because there is another concern of the latter name in Columbus.

Increases Capitalization—The Kelly-Racine Rubber Co., of Racine, Wis., which established a large tire and rubber plant 18 months ago, has filed an amendment to its articles of incorporation, increasing the capital stock from $500,000 to $1,000,000. The increased capital will permit of necessary extensions and additions to increase the production.

Everitt Dealers at Banquet—The New England dealers who handle the Everitt car held a banquet at the Hotel Lenox, Boston, last week, which was arranged by the J. S. Harrington Co., which has the Boston, Worcester and Providence agencies. There were forty-eight agents present, and following the dinner there were addresses by Sales Manager Wallace C. Hood from the factory and J. Edmund Thompson, of Worcester, the first New Englander to purchase a six-cylinder Everitt.

Ford Branch in 'Frisco—The Ford Motor Co. has established a branch house in San Francisco to handle northern California, Nevada and the Hawaiian Islands. N. A. Hawkins, commercial manager of the Ford Motor Co., spent several days in San Francisco, closing up the Ford's relations with the Standard Motor Car Co. and securing a location for the new branch. The new Ford headquarters will be in a spacious building at Van Ness avenue and Fell street. Besides the San Francisco branch Hawkins will also establish a house in Los Angeles, which will cover southern California and Arizona. The San Francisco branch will be in charge of J. B. Lund, who has been assistant manager of the Ford branch in Seattle.

Kinsey Company Election—The Kinsey Mfg. Co. of Toledo held its annual election of officers, choosing the following: President, Isaac Kinsey; vice-president, John N. Willys; secretary, H. V. Hawk; treasurer, Walter Stewart. These officers, with James W. Hawk, constitute the directorate. It is said that the force of employes will be increased from 700 to 1,000 men as soon as the new $50,000 plant is completed.

Diamond Dividend Declared—The annual meeting of the stockholders of the Diamond Rubber Co., of Akron, O., was held October 18, when the regular 3½ per cent dividend was declared, and in addition an extra dividend of 2½ per cent. Officers elected were: F. A. Hardy, president; A. H. Marks, vice-president and general manager; W. B. Miller, secretary; A. H. Noah, treasurer; Guy Norward, assistant treasurer.

Canadian Company Reports—The report of the Russell Motor Car Co. of Canada, Toronto, Ont., has been issued and shows earnings of about as forecasted when the capital was readjusted by issue of $800,000 of preferred stock a few months ago. For the year ended July 31 net profits are shown as $177,828, which is slightly over 22 per cent on the former capitalization of $800,000. The statement shows some increase in the bicycle, skate and motor department, but the Australian department failed to show an increase. It is stated that during the year the factory was operated at its full capacity. The financial statement shows underwriting and other expenses in connection with the $800,000 preferred stock issue to have been $67,466.

American Branch in Frisco—The American Motors Co., of Indianapolis, has decided to considerably enlarge the scope of its branch house in San Francisco, and as a result of a visit from J. I. Handley, a number of important changes have been made. The San Francisco branch has been incorporated as the American Motors California Co., with J. I. Handley as president. W. Scott Heywood becomes vice-president and general manager. Marc Bunnell, until now manager of the branch, becomes district sales manager for the Pacific coast and intermountain states.

Northwest Eager for Cars—Oregon, Washington and British Columbia are remarkably fine fields for the motor car business this season, according to A. D. Plughoff, vice-president of J. W. Leavitt & Co., who has just returned to San Francisco from an extended trip through that section. He states that conditions this year are in striking contrast to those of last season. He states: "When I was in the north last year I found but small interest in motor cars. I sold few cars and found no applicants for agencies. This year, when I returned, I had in my pocket orders for no fewer than thirty-eight carloads of Overland cars for immediate shipment, and I had closed up a line of agencies in all the centers of Oregon, Washington and British Columbia. Spokane alone contracted for 200 cars for the season. Vancouver wants four carloads for immediate shipment.

The 35 per cent duty imposed by the Canadian government does not affect the progress of the American cars in Canada, as they have practically no competition, even from British makers.''

Truck Business Flourishing—The Sandusky Auto Parts and Motor Truck Co., of Sandusky, O., will increase its working force more than 100 per cent in the near future. The concern now has orders for about 150 motor trucks and 400 unit power plants for motor conveyances.

Milwaukee Show Dates—The fourth annual Milwaukee motor show, the second under the auspices of the Milwaukee Automobile Dealers' Association, will be held in the Auditorium at Milwaukee, Wis., from January 20 to 26. Bart J. Ruddle, who managed the 1911 show for the association, has again been placed in charge.

Olds Branch for 'Frisco—The Olds Motor Works has established a branch in San Francisco. D. L. Whitford, who will manage the new branch, is seeking a location. The Oldsmobile for the past year has been handled in California by the Howard Automobile Co. The new local branch will control the entire state with a subordinate branch in Los Angeles. The latter will be in charge of John H. Eagal.

Award for Hess-Bright—The Hess-Bright Mfg. Co., of Philadelphia, maker of ball bearings, announces that it has received word from the Deutsche Waffen und Munitionsfabriken, for which it is importer, that the company has just been awarded the ''grand premio'' at the international industrial and trade exhibition of Turin, this being the highest distinction.

Another One Gone—An interesting commentary on the conditions of today is found in the anouncement just issued by the Hanson Wagon Works, established in 1852, at Manitowoc, Wis., to the effect that it will discontinue business on January 1. The statement says: ''The increasing use of and trade in motor vehicles and the consequent decrease in horse-drawn vehicles, as well as the great decline in the buggy and harness trade all over the country are our main reasons for discontinuing this business.'' The Hanson works were for many years known as the largest in eastern Wisconsin.

Case Back in Norwalk—The bankruptcy proceedings of the Norwalk Motor Car Co., of Norwalk, O., transferred a couple of weeks ago from Referee Ben B. Wickham, of Norwalk, to Referee Seager, of Fremont, on the representation that there was considerable feeling over the affair, will be conducted before Referee Wickham, Judge Killetts of the federal court at Toledo having ordered the matter back to Referee Wickham. In ordering the matter returned Judge Killetts expressed his belief that the matters pertaining to the settlement of the estate could be handled to the better advantage of the creditors in Norwalk than elsewhere. He also was convinced that there is not nearly as much tension over the affair as he had at first been led to believe.

Contracts for New Plant—The International Metal Polish Co., of Indianapolis, which has outgrown its present quarters in Indianapolis, is about to let a contract for a new factory building in Quill street, along the belt railroad tracks. This is to be a two-story structure of reinforced concrete and will cost about $50,000. It will be 80 by 160 feet in size.

Light Business Sold—The Avery Portable Light Co., of Milwaukee, manufacturing the Electrobola line of electric head, side and tail lights, has disposed of its patents and rights to the American Brass Foundry Co., of Milwaukee, which has been furnishing castings and parts to the Avery company. The Electrobola lights were invented by Percy C. Avery, who formerly manufactured the Avery portable gas tank.

Buys Plant at Oostburg, Wis.—The Yale Mfg. and Sales Co., located in the Home building, Milwaukee, manufacturing motor car signals and accessories, has purchased the entire plant of the defunct Oostburg Foundry Co., of Oostburg, Wis., and will in the future concentrate its manufacturing activities at Oostburg, the sales and executive offices remaining in Milwaukee.

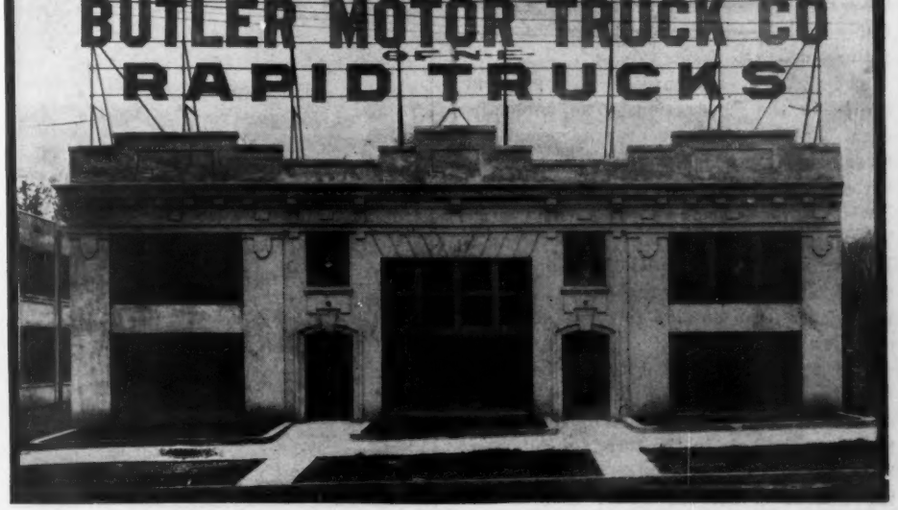
Brockville Factory Completed—The new car factory at Brockville, Ont., is about completed, and the work of installing the machinery has commenced. In 6 weeks it is expected that manufacturing will start. The officers of the new company, which heretofore only were in a preliminary state, have now assumed definite form. At a meeting of the shareholders, the following officers were elected: President, C. W. MacLean; vice-president and managing director, T. J. Storey; assistant manager, F. C. Storey; secretary, W. A. Lewis; treasurer, M. Atkinson; directors, G. J. Malloy, Frank Craig, H. W. Going.

Moves to Detroit—The Ignition Starter Co., maker of the Disco self-starters, has moved its factory and offices from Grand Rapids to Detroit. All communications should be addressed to 724 Ford building, Detroit, Mich.

Building in Toledo—The Champion Spark Plug Co. of Toledo has purchased a 1½-acre building site on the Lake Shore railway tracks at Upton and Avondale avenues, Toledo. Work will be started immediately on a new and modern fireproof plant of the Monitor type, the building to be 102 by 52 feet. It is expected that 100 men will be employed and from 12,000,000 to 15,000,000 spark plugs turned out annually. Robert Stranahan is president of the company.

New Spring Plant—The Mather Spring Co., of Toledo, which is building a factory structure near the Willys-Overland plant, will have the buildings ready for occupancy within a few weeks. The new plant covers a ground space of 80 by 400 feet, and is constructed entirely of steel and brick. The working department is on the ground floor. The concern will manufacture springs for motor cars and other vehicles, and will employ between 200 and 300 men at the start. The company is headed by Gordon Mather.

Hickman Chosen President—Isaac Hickman, president of the Hickman-Lauson-Diener Co., Wisconsin state representative of the Ford, has been elected president of the Milwaukee Dealers' Association to succeed Clifford E. Golder, who recently retired from the Curtis Automobile Co., agent for the Reo and Corbin, to engage in the mercantile business. Frank J. Edwards, manager of the KisselKar Co., Milwaukee, was the choice for secretary to fill the vacancy caused by the resignation of A. W. Shattuck, who retired as manager of the Milwaukee branch of the Thomas B. Jeffery Co.



NEW GARAGE OF BUTLER MOTOR TRUCK CO. AT BOSTON

Development Briefs

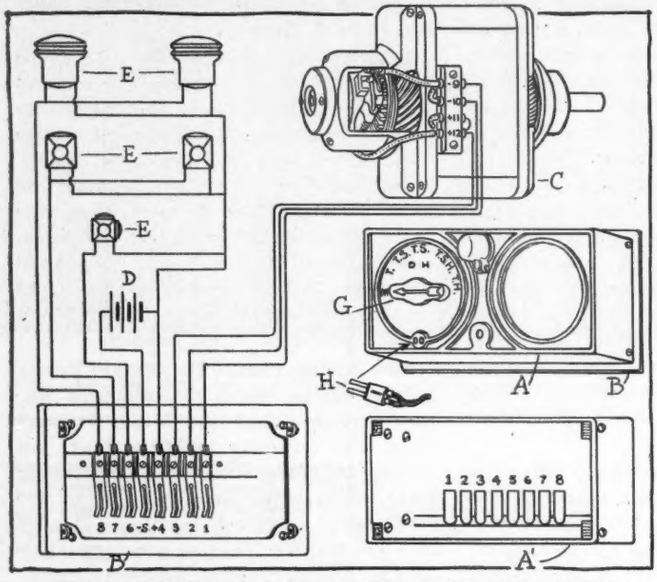


FIG. 1—WIRING OF CONTROMETER LIGHTI NG SYSTEM

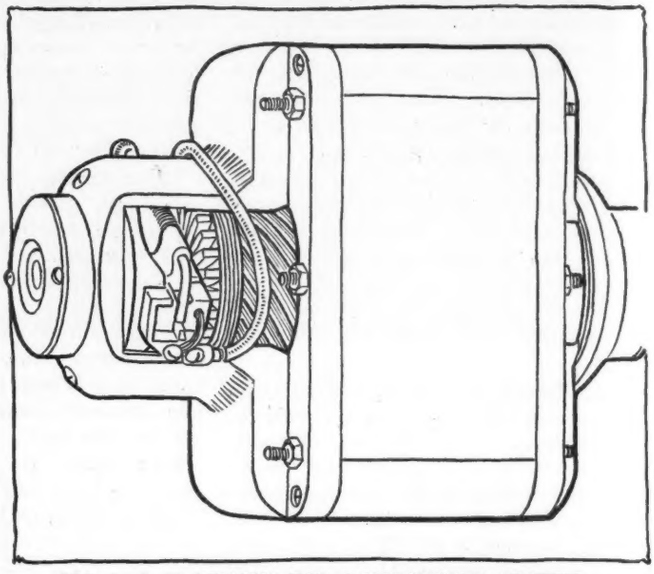


FIG. 2—L. N. DYNAMO FOR CONTROMETER SYSTEM

V-Ray Spark Plug

IN Fig. 3 is illustrated the original exponent of the four-point spark plug theory, the V-ray plug, as manufactured by the Marshalltown Motor Material Mfg. Co., of Marshalltown, Ia. There are several features about the construction of the plug in which it departs from ordinary practice.

Aside from the use of the four sparking points the plug is different in that these points are made with a V-shaped groove in the ends as shown at P. It will be noticed that the porcelain is so mounted that it does not touch any of the steel shell or brass bushing parts. The porcelain is swung above and below on ductile gaskets A, A1 and A2, in which asbestos is entirely housed in copper collars. This provides for .007 inch expansion of the inner electrode shank without strain on the porcelain—a frequent cause of plug failure.

The general makeup of the plug is shown in the illustration. The porcelain core T carries the center terminal B. Over this sets the brass sleeve S, which is threaded on the outside and sets at its lower end against the asbestos gasket A. The outer nut N carrying the four points P screws up over S until it comes to a seat against the lower gasket A2. It is threaded on the outside to screw into the cylinder head.

The upper end of the terminal nut is milled spirally, as indicated, and in the end is a small hole. In case of fouling of the plug, the hole in the terminal nut may be placed over the center point B and the nut revolved, the spiral threads on the outside acting as a file to brighten up the ends of four spark points. The five electrodes are said to be made of a secret alloy that is guaranteed against corrosion, flaking, or other deterioration due to the intense heat of the cylinder. The salient virtue claimed for the plug as a whole is the extreme penetration of the electrodes wherein the spark is delivered down and away from the stratum of burnt gases lying at the top of the cylinder.

Contrometer Electric Lighting

One of the newest outfits for electric lighting of the motor car is the Contrometer electric lighting plant manufactured by the Leece-Neville Co., Cleveland, O. It is of the type in which a storage battery is kept fully charged by a dynamo which at the same time furnishes current for lights and ignition. The wiring connections are shown at the left of Fig. 1 and at the right is illustrated the front and rear views, A and A1, of the automatic current regulating device. This is called the contrometer and is mounted on the dash. It carries the switch G and a plug socket H for the inspection lamp.

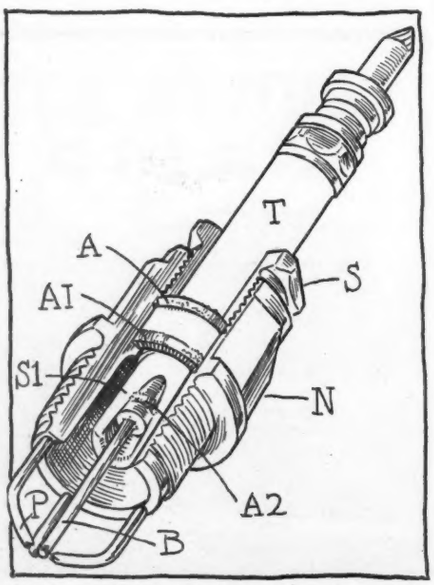


FIG. 3—CONSTRUCTION OF V-RAY PLUG

The L-N dynamo used in these plants is shown at C, Fig. 1, and is illustrated more in detail in Fig. 2. It is driven at a very low speed, being geared to the engine to run at about 1½ times engine speed, that is, to rotate at about 500 revolutions per minute when the car is going at 10 miles per hour. The chief feature of the system is that the dynamo is entirely self-controlling and regulates its voltage and current output automatically, without friction clutch or magnetic clutch, ball governor, rheostat or fan.

The terminal block B is screwed to the dash of the car, and is then wired to the dynamo C, battery D and lamps E. The contrometer case A is then attached to the terminal block. The two terminals 4 and 5 of the terminal block can be connected through the proper switches to the wiring for the ignition, electric horn, etc.

Elba Lighting Batteries

Motorists who are not familiar with the capabilities of storage batteries sometimes try to use an ignition battery for lighting, but when this is done satisfactory service can not be obtained. The sparking battery is built for the special service of motor ignition and for that reason has a very low discharge rate,

which makes it unsuited for discharging at the high rate required for lighting three or more lamps.

The essential difference between the sparking battery and the lighting battery is the discharge rate, in other words, the rate at which the battery can give out its current. The lighting battery has a normal discharge rate correctly proportioned to the amount of current taken by the lamps, and must be larger than a sparking battery.

When a lighting generator is installed on the car for automatically maintaining the battery in a fully charged condition the owner should see to it that the battery has a normal charging rate high enough to receive the maximum output of the machine without injury. If too small a battery is continuously charged, its period of life will be greatly shortened. As a general proposition nothing smaller than a 100-ampere-hour battery should be used.

In providing special storage batteries for electric lighting service, the Willard Storage Battery Co., of Cleveland, O., has developed its line of Elba lighting batteries. One of these is illustrated in Fig. 5. The service from these batteries is said to be as dependable and efficient as are the lights in the residence. The batteries made by this firm for lighting motor car lamps are about twice the size of those designed for ignition alone.

No-Key Padlock

One of the chief objections to the use of padlocks about the car has been the fact that the driver was tied up whenever the key was lost or forgotten. Padlocks are often of much value in preventing theft of accessories or even of the car itself, and were it not for the bother of the keys would be much more widely used.

The American Keyless Lock Co., Chicago, has developed a form of keyless padlock which answers the purpose of a safety device admirably, at the same time doing away with the necessity of a key.

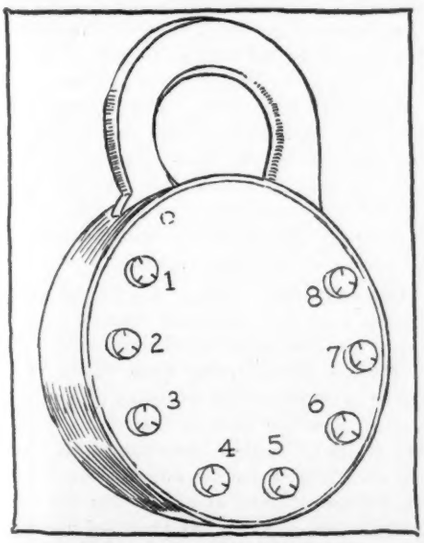


FIG. 4—NO-KEY PADLOCK

It involves a combination lock worked by a series of buttons and is illustrated in Fig. 4.

Notice the buttons number from 1 to 8 on the illustration. There are eight of them on each side, any of which may be included in a combination, and, when pressed, the lock will respond and open instantly. The padlock locks like an ordinary spring lock—just close it. To open it requires no key, no knobs to turn, no clicks to count—simply press the buttons and the lock responds. It can be operated almost as quickly and easily in the dark as in the light.

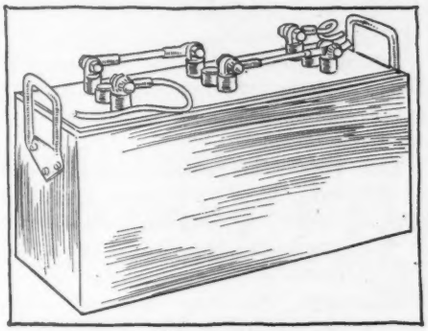


FIG. 5—ELBA LIGHTING BATTERY

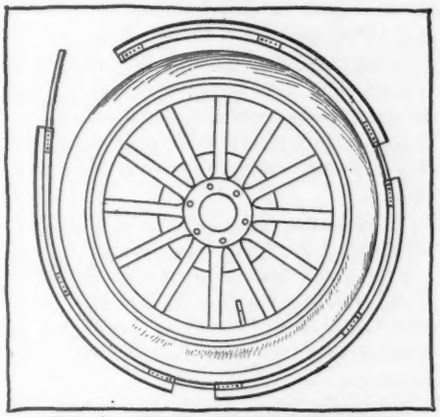


FIG. 6—FUDGE EMERGENCY TIRE

There are said to be more than 40,000 combinations possible on each lock, and it cannot be opened by anyone not acquainted with the special combination on which it has been set. The combination can be changed in a moment by the owner if desired.

The padlock is practically indestructible, being made entirely of brass; it is absolutely rust-proof, strong enough to stand the greatest strain, and embodies no intricate mechanism to get out of order.

Prest-O-Lite Self Starter

One of the interesting developments of the week is the announcement by the Prest-O-Lite Co., of Indianapolis, that it has perfected a self-starting device to be used in connection with Prest-O-Lite gas tanks. The total weight of the attachment is said to be only 6 pounds, and it operates much on the principle of the pressure gun. A handle on the dash sucks a charge of gas from the gas tank and pushes it into each cylinder. The operation is simply one out-and-in stroke. The amount of gas forced into each cylinder is regulated by a reducing valve, so that it is impossible to get more than the small amount necessary to charge the cylinder. It is said to be adaptable to all makes of motors and should be of benefit in making any car self-starting that is equipped with gas tanks for lighting. This is a feature that will appeal to a very large number of motorists.

Ideal Spring Seat

To make the car more comfortable for the occupants of the rear seat, where the road shocks are more plainly felt, George W. Robertson of Mount Vernon, Ind., is making a special rear seat. This is called the Ideal seat and has a shock-absorbing spring seat and spring back. It is illustrated in Fig. 7, and by means of the eye and pin connection at A, the face of the back is made to move up and down with the seat proper. This does away with the rubbing of the passenger's back against the back of the seat as there is no relative motion between the two. Coil springs are employed to give resiliency to the cushions.

Fudge Emergency Tire

To prevent a tire being ruined by running on it in a deflated condition, a sectional emergency tire has been brought out. This is intended to be mounted over the deflated tire without removing it from the rim. The tire consists of three sections of solid rubber in which is imbedded a flexible rack which projects beyond each section at one end to lock in the adjacent end of the next section of the emergency tire and thus make a perfect hoop about the regular casing.

When a tire goes flat the emergency tire is connected at two of the joints, leaving the third open. Then it is laid out on the ground and the wheel with the flat tire run on to it. The ends of the emergency tire are then brought together as shown in Fig. 6 and locked tight with a key. The sectional tire is made by the Fudge Brothers Mfg. Co., Marion, Ind. It is also built in two- and four-section types in addition to the three-section type described and illustrated here.

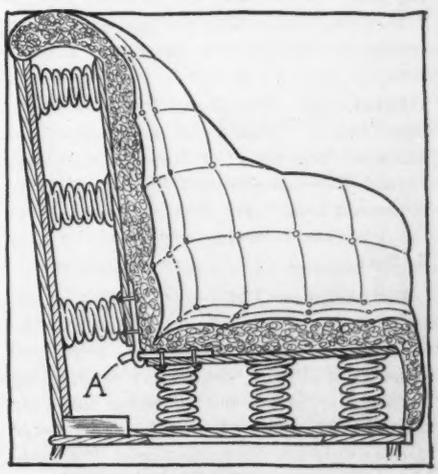


FIG. 7—IDEAL SPRING SEAT

Brief Business Announcements

EAU Claire, Wis.—Fred A. Lange is building a garage here.

Kalamazoo, Mich.—Arthur Fiske and Harry Parker have taken the agency for the Lion.

Franklin, Pa.—The King Automobile Co. has taken the agency for the line of 1912 Kline cars.

Worcester, Mass.—The Lemont Motor Co., agent for the Elmore and National, has taken on the Brush line.

Syracuse, N. Y.—F. V. Coville has been appointed buyer for the H. H. Franklin Mfg. Co., succeeding W. G. Lindsey, who resigned.

San Francisco, Cal.—The northern California agency for the Selden car has been placed with the Middleton Motor Car Co. of this city.

Worcester, Mass.—The J. W. Sargent & Son Co. agent for the Stevens-Duryea, has taken the agency for Worcester and Worcester county for the Kelly motor truck.

San Francisco, Cal.—The H. O. Harrison Co. has taken the agency for the Waverley electric. Harrison also is California distributor of the Peerless and Everitt.

Colton, Wash.—The Inland Implement Co. has recently signed a contract to handle the Overland cars in this vicinity the coming season, being a sub-agent of H. L. Olive & Co., of Spokane.

Philadelphia, Pa.—Announcement is made that plans are being prepared by architects for a large car factory which the Otto Gas Engine Co. contemplates erecting at Mount Holly, N. J., a short distance from Philadelphia, to cost $100,000.

Columbus, O.—Alleging debts in excess of $1,000, a petition has been filed against the Radio Mfg. Co., of Columbus, O., asking that the company be declared a bankrupt. The Radio Mfg. Co. was formed recently to manufacture parts and accessories.

Toledo, O.—The Ford Brothers Auto-Sales Co., of Toledo, was incorporated for business this week by Guy R. and J. R. Ford. The concern will deal exclusively in second-hand cars, having taken over the business formerly conducted by Guy R. Ford..

Los Angeles, Cal.—L. J. Ollier, manager of the Los Angeles branch of the Studebaker Corporation, has completed negotiations for a larger service building in this city. The new building has more than 30,000 square feet of service space located on East Seventh street. The Lord Motor Car Co., of Los Angeles, will continue to act as retail distributor of the Studebaker line.

Racine, Wis.—A. Anderson is building a large garage and repair shop at 915 Washington avenue.

Yuba City, Cal.—Harry Butler of Grass Valley is contemplating establishing a garage in this city.

Detroit, Mich.—Sievers & Erdman, Jefferson avenue and Beaubien street, have taken on the agency for Mercury trucks in Wayne county.

New York—The Newton-Humphreyville Co., Newark, N. J., has been appointed Thomas dealer by the New York branch. It will handle the Thomas car in central New Jersey.

Pittsburgh, Pa.—The Citizens' Automobile Co., of Huntington, W. Va., and Charles E. Ward, of Charleston, W. Va., have signed up as Franklin sub-dealers for their territory.

Flint, Mich.—After having been connected with the W. A. Paterson Co. for several years, Patrick H. Doherty has resigned to become associated with Benjamin Rozenzweig, Jr., in the parts business.

Minneapolis, Minn.—Louis A. Root, who established the Hupp-Yeats branch in Minneapolis, and has since been its manager, 1334 Nicollet avenue, has retired from the business and gone to his home at Detroit to go actively into the insurance business.

Baltimore, Md.—Plans are being prepared for the removal into new quarters by C. R. Mizner, Baltimore representative for the Oldsmobile. The new quarters, consisting of a show room and machine shop, are located at 1419 North Charles street.

Pontiac, Mich.—S. L. Stone has tendered his resignation as assistant sales manager of the Oakland Motor Car Co., of Pontiac, to become general manager of the Centaur Motor Co., of Buffalo, which handles Oakland cars in western New York and Pennsylvania.

San Francisco, Cal.—The Velie hereafter will be handled in northern California by the Auto Sales Co. For the past 3 years the Velie has been handled by the Standard Motor Car Co., which, however, has lately become distributor of the Stoddard-Dayton line.

Minneapolis, Minn.—The Pierce-Arrow Automobile Co. of St. Paul, connected with the Waldref-Odell Co. of Minneapolis, handling the Pierce-Arrow line of motor cars, has a new one-story garage and shop at Fifth and Seventh streets, costing $15,000. It is 40 by 150 feet, and brick. To put in a truck line, the company had to have more room than in its present quarters at Sixth and Exchange streets.

West Bend, Wis.—The A. C. Fuge Hardware Co. has been appointed agent for the Buick in Washington county.

San Francisco, Cal.—W. R. Kneiss and L. H. Bovee have recently opened the first Motorette agency in San Francisco on Golden Gate avenue.

Mineral Point, Wis.—L. A. Ross has retired from the garage and agency business, and his interest has been purchased by David Jackson.

Worcester, Mass.—H. S. Knickerbocker has signed to take over the Cole agency in this city and will open headquarters on Commercial street.

York, Pa.—The Pullman garage, Cumberland, Md., has taken the agency for Pullman cars. H. T. Beck, manager, has just completed the erection of a large new modern garage.

Worcester, Mass.—The Moline, which has not been represented in this city for some time, will be taken over by Bennett Brothers, who will make their headquarters on Commercial street.

Wilmington, Del.—H. C. Savage and W. W. Bush have purchased the garage of the J. R. Richardson Auto Co., at Eleventh and West streets, and will conduct it under the name of the Central garage.

Lansing, Mich.—It is announced that the Olds Motor Works is to open a branch in Saginaw for the distribution of cars in that city and surrounding territory. William H. Watt will be in charge of the branch.

Spokane, Wash.—The Western Maytag Motor Car Co. has given up its Second avenue quarters, moving to the Graybill garage on the north side. L. D. Hewitt, Reo agent, has taken complete charge of the building, subletting a part of it to the George W. Merrill Auto Co.

Kenosha, Wis.—The Purdy Garage Co. has been incorporated here to succeed to the business of the Kent Motor Car Co., the business of which was recently purchased by Frederick Purdy. The Kent garage on Church street will henceforth be known as the Purdy garage.

Oakland, Cal.—Frank R. Fageol has opened new and elaborate Rambler sales rooms on Telegraph avenue in this city. A feature of the great sales rooms is a frieze in water colors depicting the entire line of Rambler cars in their true colors and styles of bodies. Another novel idea has been carried out by Fageol. He has a large piece of land and upon the unoccupied portion of it he has provided a large number of stalls which will be rented out

at a nominal cost to persons who have no garage at their residence.

DePere, Wis.—Toonen & Barlament are building a garage and repair shop, 50 by 60 feet in size and two stories high.

Baltimore, Md.—Among the latest cars added to the local field is the Cutting. The agency for this district has been placed with the Rice garage.

Toledo, O.—A. A. Atwood has secured the agency for the Matheson. He has territory covering northwestern Ohio and the lower peninsula of Michigan.

Grand Rapids, Mich.—The Mercury garage, 316 Kent street, owned by Fisher & Hoogerhyde, has taken the agency for Mercury light delivery trucks in the western Michigan territory.

Vinita, Okla.—The secretary of state has issued a charter to the Vinita Automobile Co., capital $10,000. The incorporators are Walter A. Cronan, M. R. Kapp and Mrs. M. R. Kapp.

San Francisco, Cal.—George A. Troutt, representing the Lion Motor Car Co. of Detroit, has placed the northern California agency for the Lion with the Reliance Automobile Co. of this city. The Lion will be handled in conjunction with the Knox and Detroit electric lines.

New York—The Stearns people are making ready to transfer their service department to their new building on Fifty-fifth street, just off Ninth avenue. This is a six-story building measuring about 60 by 100 feet and will be entirely devoted to the service of owners of Stearns cars.

San Francisco, Cal.—The Halliwell Co. has been incorporated with a capital stock of $50,000 to take over a number of well-known accessories on the coast, including the Warner Autometer, the Martin shock absorber and the Disco self-starter. In addition to these the company will handle a number of other accessories.

Milwaukee, Wis.—C. R. Dashiell, manager of the Milwaukee and Wisconsin branch of the Studebaker Automobile Co., has been transferred to Chicago. The present headquarters of the Milwaukee branch, at Milwaukee and Mason streets, will be moved to 414-416 Milwaukee street in a short time.

Jefferson, Wis.—The Kenzler-Waverly Motor Co. has started work on the first unit of its new plant here, which will be a factory building, 60 by 100 feet and two stories high. The concern is a consolidation of the Waverly Mfg. Co., of Milwaukee, and the Kenzler-Waverly Co., of Cambridge, Wis.

Oklahoma City, Okla.—The Cadillac Co. has been organized in this city with a capital of $25,000, the corporation being chartered by the secretary of state. The company will handle the Cadillac cars and the officers of the corporation are as follows: Frank McIntosh, president; Carlton Barbour, secretary and treasurer. L. T. Hudson will continue as the Cadillac representative in the eastern portion of the state with headquarters at Muskogee.

Brooklyn, N. Y.—The Marion Motor Car Co., 1281 Bedford avenue, has secured the agency for Mercury trucks for Long Island.

Philadelphia, Pa.—The Eastman Motor Truck Co. has established temporary quarters at 1141 South Broad street for distribution in Philadelphia and vicinity of the Wilcox truck, a new addition to the Quaker City commercial vehicle family.

Boston, Mass.—The Kisselkar New England branch has appointed the Kisselcar Co., Providence, R. I., distributor for southern and western Rhode Island.

St. Paul, Minn.—The Pierce-Arrow Automobile Co. is erecting a one-story brick

Recent Incorporations

Dayton, O.—Marion Automobile Co., capital $5,000; to do a general motor car business; incorporators, Leslie B. Eaton, Frank W. Pennebaker, O. G. Stout, William G. Frizzell and C. L. G. Breene.

Dayton, O.—Ohio Mercer Sales Co., capital $20,000; to buy and sell motor cars, motor trucks and accessories; incorporators, George A. Ware, M. E. State, F. P. Chamberlin, B. L. Hull, J. I. Robeson.

Cleveland, O.—Start-O Co., capital $10,000; to manufacture and sell acetylene, motor starters, accessories and supplies; incorporators, Henry P. Beckenbach, Hubert B. Fuller, E. L. Stoiber, William S. Fitzgerald and R. M. Hard.

Martinsville, O.—Clucker & Hixson Co., capital $2,500; to manufacture and sell parts and accessories; incorporators, C. E. Westervelt, C. L. Hixson, Melcena West Hixson, W. B. Jackson and F. A. Kehrer.

Dayton, O.—Dayton and Troy Automobile Co., capital $10,000; to do a general motor car business, including operating a garage and repair department; incorporators, C. E. Emerick, S. S. Faulkner, W. J. Sherer, S. B. Franklin and D. B. Sherer.

Fremont, O.—Northern Ohio Punctureless Tire Co., to establish an agency for the sale of punctureless tires; incorporators, F. E. Lewis, John Nieset, L. P. Nieset and C. N. Bowen.

Fayetteville, N. C.—Consolidated Motor Co., capital stock $25,000; incorporators H Lutterloh, J. U. McKethan and Benjamin McMillan.

Sherman, Tex.—Sherman Automobile and Vulcanizing Co.; incorporators F. D. Welch and P. M. Shelton.

Linton, Ind.—Linton Garage Co., capital stock $10,000; to deal in motor cars; directors A. T. Custer, G. C. Porter and T. J. Holden.

Schenectady, N. Y.—S. R. Mfg. Co., capital stock $50,000; to manufacture motors; incorporators O. Kafka, J. W. Heyman and J. Brandon.

Jersey City, N. J.—Seventh Avenue Garage Co., capital stock $25,000; incorporators Charles H. Weller, Harvey B. Hall and Leo J. Cain.

Cleveland, O.—Moore & Rigley Garage and Sales Co., capital stock $10,000; William H. Moore, John Moore, A. V. Rigley, C. F. McGee and C. E. Alden.

Toledo, O.—Ford Brothers Automobile Sales Co., capital stock $10,000; incorporator Guy R. Ford.

Chicago—University Taxi Service Co., capital stock $2,500; conduct taxicab and livery business; incorporators Frank H. Drury, W. Perry Hahn and Walder D. Launder.

Chicago—Chicago Motor Omnibus Co., capital stock $1,000; to operate omnibuses; incorporators Henry P. Schandler, J. M. Johnston and K. Cornwell.

Donaldsonville, La.—Donaldsonville Garage and Automobile Supply Co., capital stock $10,000; president, James P. Kock, vice president, K. A. Aucoin, secretary and treasurer, Adolphe Netter.

Augusta, Ga.—Overland Motor Car Co., capital stock $10,000; incorporators W. R. Eve, J. H. Prontant and R. E. Carroll.

Montclair, N. J.—Frank A. Reeve Co., capital stock $50,000; incorporators F. A. Reeve, J. A. Butler and D. H. Slayback.

salesroom and shop at Fifth and Seventh streets, cost $15,000.

Cedar Rapids, Ia.—Beck & Son are building a new $12,000 factory, in which they will manufacture eighteen-passenger buses.

Baltimore, Md.—The Stoddard-Dayton Automobile Co. of Baltimore is handling the Brush car in Baltimore and vicinity.

Wilmington, Del.—William B. Austin, proprietor of the Pennsylvania avenue garage, has taken the local agency for the Locomobile. He has the state and peninsula for his territory.

Flint, Mich.—Floyd A. Allen, acting assistant to General Manager Nash, of the Buick Motor Co., has been promoted to the position of assistant secretary and treasurer of the company, with headquarters at the local plant.

Indianapolis, Ind.—Cory & Copher, who have been in business at Dayton, O., have leased a new one-story concrete building in College avenue, near Sixteenth street in Indianapolis, and will conduct a garage. The building is 60 by 100 feet and was recently completed at a cost of $60,000.

Atlanta, Ga.—The Hupp Corporation of Detroit will establish a branch here just as soon as its new building, corner Peachtree street and North avenue, is completed. J. D. Palmerlee will be in charge and direct the sales of the R. C. H. gas car and the Hupp-Yeats electric for this territory.

San Francisco, Cal.—The National agency for northern California has been annexed by the Howard Automobile Co., coast distributor of the Buick cars. Carl Christensen, hitherto representative of the National, joins the Howard forces. The Howard company already represents the National in Oregon.

Indianapolis, Ind.—The Stromberg Motor Devices Co. has removed its Indianapolis branch into new and more commodious quarters at 514 North Capitol avenue, Indianapolis. It is now in charge of J. B. Morrow. Charles Kolbenstetter, former manager at Indianapolis, has been returned to Chicago, out of which office he travels as special representative.

San Francisco, Cal.—G. L. Wands has been appointed director of agencies for the Haynes Auto Sales Co., coast distributor of the Haynes and Krit cars. His territory will include California, Oregon, Washington, Nevada, Arizona and Idaho. Charles Corcoran takes his place as sales manager of the local Haynes branch.

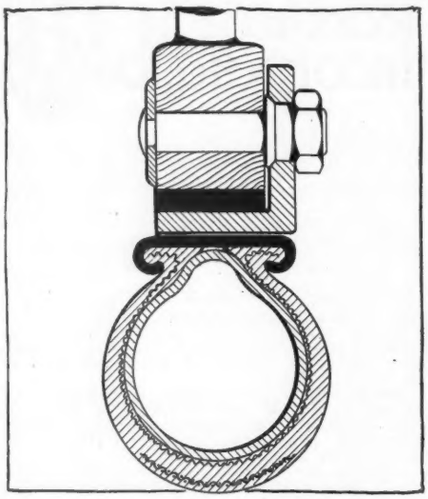
Madison, Wis.—The Spooner-McConnell Automobile Co. has been organized here by Charles F. Spooner, formerly interested in the Hokanson Auto Co., and George K. McConnell, who formerly represented the Reo in Madison. The company has leased part of the Wisconsin Wagon Co.'s plant and will handle the Kisselkar and Oakland.

Current Motor Car Patents

Ideas of the Inventors

GASKILL Two-cycle Engine—No. 1,004,564, dated October 3; to Raymond Gifford Gaskill, Fort Deposit, Md.—The internal combusion engine to which this patent relates comprises a cylinder provided with a gas chamber, an intake valve providing communication between the cylinder and this chamber, the cylinder being formed with a circumferential series of exhaust ports and with an annular exhaust chamber surrounding and communicating with these ports, an intake pipe connected to the gas chamber, an exhaust pipe connected with the exhaust chamber, these pipes being respectively provided with chambers, blowers mounted in the respective chambers, a blower shaft extending through both of the pipes and connected to the blowers, a bevel pinion connected to the blower shaft which meshes with a pinion secured to the motor crankshaft, a piston mounted in the cylinder and adapted to uncover the exhaust ports and a crankshaft connected to the piston.

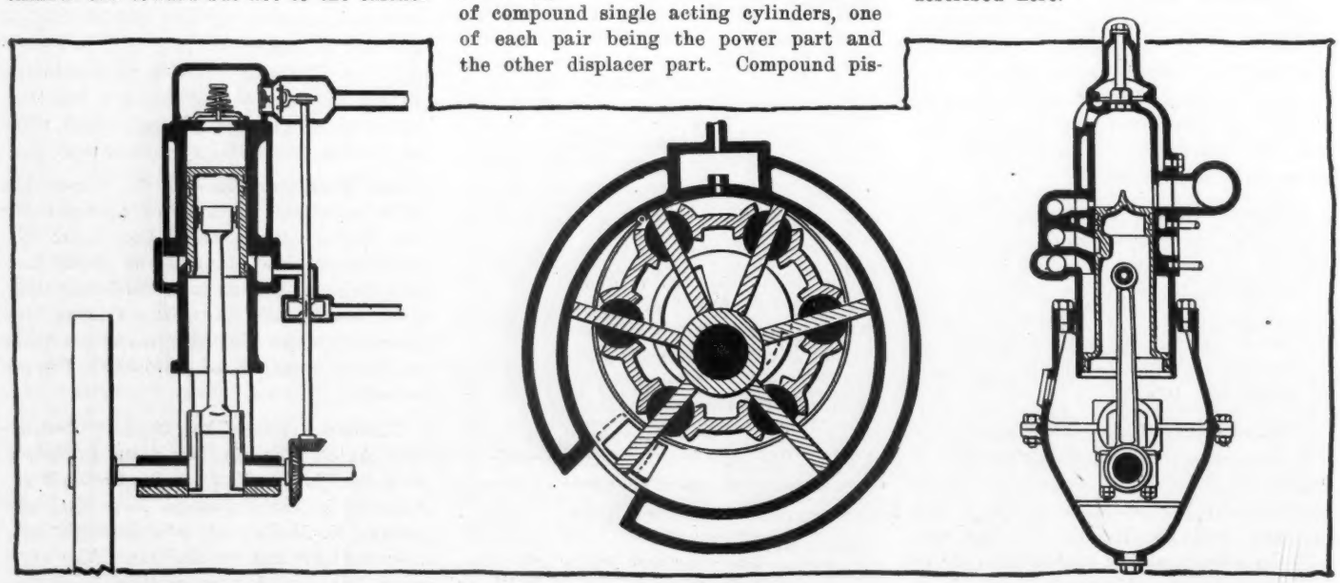
Phillips Demountable Rim—No. 1,001,886, dated August 29; to Elwood S. Phillips, Chicago—The demountable rim to which this patent relates covers a wheel comprising a felloe, a bolt extending through the felloe and having a plate on one end thereof, screws securing the plate to the felloe, a band on the felloe, wedges on the band, each having a projection thereon extending from the thicker end toward but not to the thinner end thereof, a projection on the band, a rim extending about the band, wedges on the inner side of the rim in engagement with the wedges that are on the band and each having a recess that extends from the thinner end toward but not to the thicker end thereof and receiving the projection of the engaging wedge. The thinner end portion of each wedge being longer at one side than the opposite side of the plane of the recess, an abutment on the inner side of the rim, a wedge between the two abutments, a keeper in the wedge, and a nut swiveled in the keeper and engaging the bolt, arranged as shown in the accompanying illustration.



PHILLIPS DEMOUNTABLE RIM
Bolted-on type rim of novel design involving wedges and wedge ring

Appleton Two-Cycle Engine—No. 1,004,720, dated October 3; to William Morten Appleton, Weston-super-Mare, England.—The engine to which this patent relates is a two-cycle one of the double diameter piston type. It is a combination of a series of compound single acting cylinders, one of each pair being the power part and the other displacer part. Compound pistons work these cylinders, there is an inlet port in each power part, a gas by-port in each power part and a passage in each power piston adapted to put the inlet and gas by-ports into communication during a predetermined part of the stroke of a piston, a by-pass port in each power part, an exhaust port in each power part, an air port in each power part, a passage in each power piston adapted at a predetermined stroke of the piston, to put this air port into communication with the by-pass port, a distribution port in each displacer part, a distribution passage connecting the gas by-port of the lower part of one cylinder, the by-pass port of the power part of another cylinder and the distribution port of the displacer part, all combined and arranged as shown in the accompanying illustration.

Shoeck Rotary Engine—No. 1,004,696, dated October 3; to Ralph Shoeck, Oerlikon, Switzerland—This patent relates to a rotary combustion engine comprising a cylinder having an exhaust port, an inlet for the combustible, and an air inlet port, all located approximate the periphery of the cylinder and an air inlet, and a delivery passage proximate the center of the cylinder, a drum mounted to rotate within the cylinder eccentrically, pistons passing through the drum to the cylinder wall, and moving with the drum, forming walls of the combustion chamber between the cylinder and drum, walls of the compressor or pump chamber within the drum, the combustion chamber coöperating with the ports and inlet proximate the periphery of the cylinder, and the pump chamber with the passages proximate the center of the drum described here.



GASKILL MOTOR
A two-cycle design with blower in the gas manifold

SHOECK ROTARY ENGINE
Rotary gas motor with eccentric rotor having inlet at outside and exhaust at center

APPLETON GAS MOTOR
Two-cycle motor with double diameter piston of the compound single-acting type